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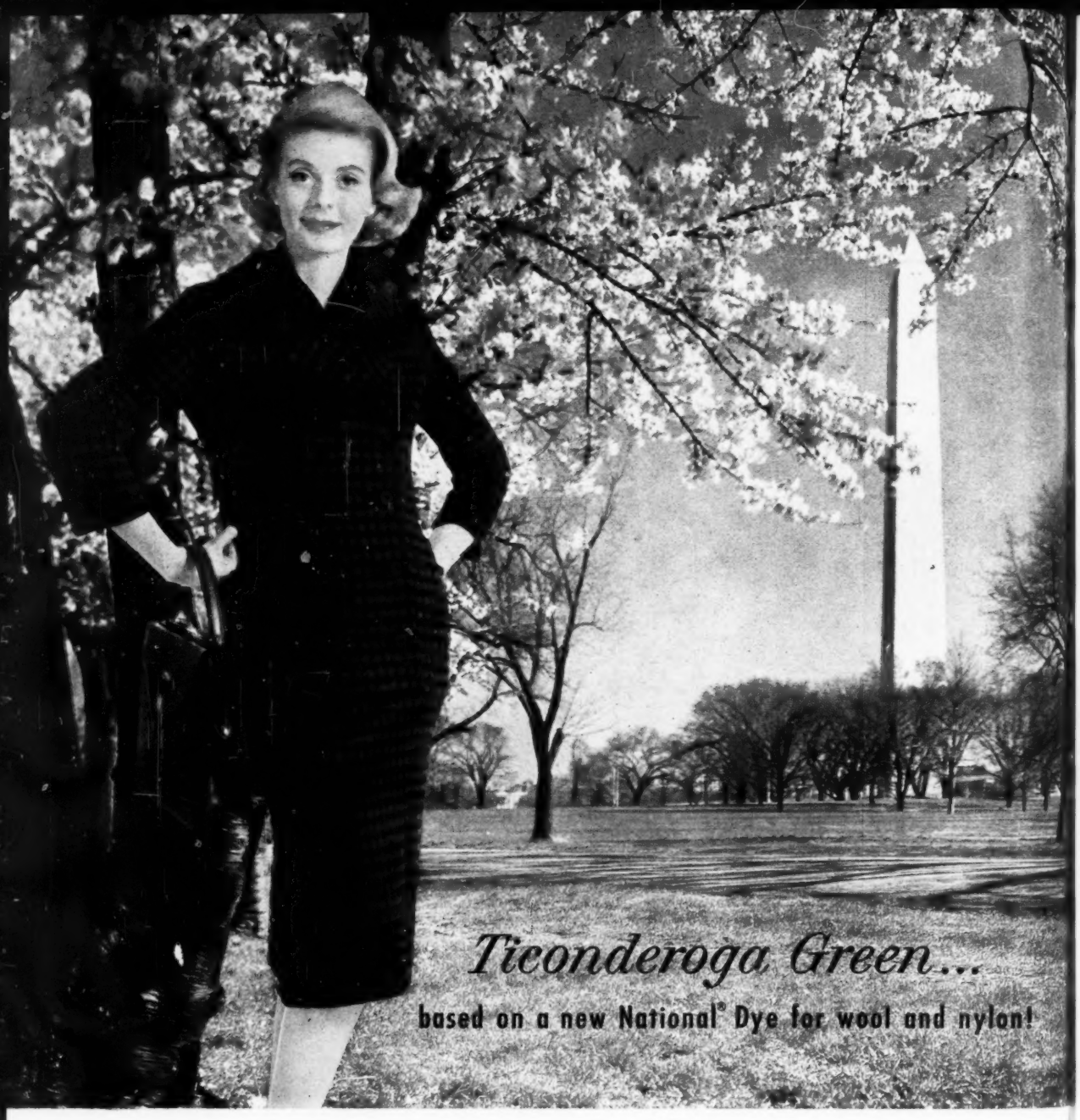

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DYESTUFF REPORTER

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METHODS TO IMPROVE RESILIENCE OF COTTON PILE YARNS IN SOFT FLOOR COVERINGS*

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Various formulations of synthetic latex and dimethylol cyclic ethylene urea (DMEU) resin have been applied to cotton carpet yarns prior to the construction of carpets. An improvement in compressional resilience was obtained with a 60/40 mixture of a butadiene-high acrylonitrile latex and DMEU resin. However, this improvement, detectable on a subjective basis, was not detected by the compressometer method of testing. A modified test method, based on deformation in padder squeeze rolls, gave results that were more consistent with subjective evaluation of carpet pile resilience.

INTRODUCTION

COTTON yarns have been used as a pile material in rugs and carpets for a number of years. The construction of most cotton rugs is by the tufting process. In smaller rugs and bed spreads, the end product is known as chenille. Chenille usually has a lower pile density than cotton carpeting.

Cotton rugs had enjoyed an expanding market until the advent of synthetic fibers. With development of rayon rug fibers, the deficiencies of cotton as a pile material were emphasized. To be sure, cotton has many desirable properties for rug use. It is relatively inexpensive, it may be dyed to give beautiful pastel shades and it cleans without difficulty. However, its most obvious drawback is its low recovery from deformation. The work reported here was undertaken to determine whether it is possible to improve the qualities of cotton with respect to its use in carpets.

THEORETICAL CONSIDERATIONS———Expressions that are frequently used to describe the behavior of the pile floor coverings are "compressional resilience" and "compressibility." In a survey of papers on resilience by Dillon (*1*), it was found that 50 percent of the papers used this definition:

$$\text{Resilience} = \frac{\text{energy of retraction}}{\text{energy of deformation}}$$

The energy of retraction is the energy given up by the pile fabric in relief of strain. According to Dillon, variables that affect this ratio are: temperature of the pile, moisture content of the pile, rate of strain, rate of retraction, number of cycles of deformation, rest period between cycles, and the nature of the cycle.

Beckwith and Barach (*2*) do not consider the measurement of resilience to be adequate to describe a pile surface because the resilience of dissimilar materials such as glass and rubber are about equal. They consider the work of compression to be an aid in defining the luxurious quality of a carpet. In their work, they attempted to duplicate the footstep of an average-size man on a carpet. Loading and unloading at 120 lb/min up to 12 psi was found to give the desired results. The load was maintained for 0.5 sec before unloading.

Schiefer (*3*) used the following definitions in evaluating the behavior of textile fabrics:

Standard thickness is the thickness of the specimen when the pressure of the compressometer foot is increased to one psi.

Compressibility is the ratio of the rate of decrease in thickness with pressure at a pressure of one psi, to the standard thickness.

Compressional resilience is the work recovered from a specimen when the pressure is decreased from 2.0 psi to 0.1 psi, expressed as a percentage of the work done on the specimen when the pressure is increased form 0.1 psi to 2.0 psi.

On the basis of these definitions, it may be said that cotton carpet piles have low compressional resilience. The work to be outlined here was undertaken to improve the compressional resilience of cotton carpet yarns. Abrams and Sherwood (*4*) found that certain elastomeric materials, such as a latex of polyacrylic ester in combination with minimum amounts of dimethylol cyclic ethylene urea, gave excellent crease resistance and wrinkle recovery when applied to cotton fabrics. In other words, the treatment gave good resistance to deformation, and good recovery from deformation. These are precisely the properties that are desired for cotton carpet yarns. Therefore, the major part of the work has been devoted to the application of synthetic latices with and without aminoplasts to cotton carpet yarns, and their evaluation. Also, in some treatments, lubricating agents were added for improved sewability.

PROCEDURE

METHOD OF APPLICATION———Twelve ends of tufting yarn (No. 8, six ply; two and one-half turns to the ply) were treated and cured in one continuous operation on the Southern Research Institute slasher. This slasher is equipped with a size box, a dry box, lease rods, and a take-up mechanism. The insulated size box, of stainless steel, has a capacity of 1500 ml. The size box can be heated, but in this work was kept at room temperature. Three stainless-steel rolls, three inches in diameter and 4.5 inches long, are mounted in the size box, one serving as an immersion roll and the other two as

*This research was carried out under the sponsorship of Southern Utilization Research and Development Division, U S Department of Agriculture, under Contract 12-14-100-310 (72).

**Present address—Chemetron Corp, 840 North Michigan Ave, Chicago 11, Ill

TABLE I

Composition of treating baths

Formula no.	Sewability	Solids %	Latex-resin ratio	Formula (g/two liters) Polyacrylic latex	Butadiene-high acrylonitrile latex	DMEU*	Inorganic acid-forming salt**	Softener type***
Untreated	good	—		—	—	—	—	none
821-36	very poor	20	100-0	—	954	—	—	none
821-37	none	20	10-90	—	95	720	18	none
821-38	none	20	20-80	—	191	640	16	none
821-39	none	20	30-70	—	285	560	14	none
821-40	none	20	40-60	—	357	480	12	none
821-41	none	20	50-50	—	476	400	10	none
821-42	none	20	60-40	—	571	320	8	none
821-43	none	20	70-30	—	666	240	6	none
821-44	poor	20	80-20	—	762	160	4	none
821-45	poor	20	90-10	—	857	80	2	none
821-46	none	10	0-100	—	—	400	10	none
821-48	very poor	5	70-30	137	—	60	1.5	none
821-49	poor	5	70-30	137	—	60	1.5	solubilized fatty glyceride
821-50	very poor	10	70-30	274	—	120	3	di(2-ethylhexyl)phthalate
821-51	poor	10	70-30	274	—	120	3	fatty carbamide
821-52	poor	10	70-30	274	—	120	3	polyalkyleneglycol
821-53	fair	7	70-30	192	—	84	21	fatty carbamide
821-54	fair	5	70-30	140	—	60	1.5	fatty carbamide
821-55	fair	3	70-30	84	—	36	0.9	fatty carbamide
821-56	poor	8.5	70-30	233	—	102	2.5	fatty carbamide
821-57	poor	8.5	70-30	—	284	102	2.5	fatty carbamide
821-58	fair	8.5	60-40	204	—	136	3.4	polyalkyleneglycol
821-59	medium	8.5	60-40	—	243	136	3.4	polyalkyleneglycol
821-60	poor	8.5	50-50	170	—	170	4.3	polyalkyleneglycol
821-61	poor	8.5	50-50	—	202	170	4.2	polyalkyleneglycol
821-62	none	8.5	40-60	136	—	204	5.1	polyalkyleneglycol
821-63	none	8.5	100-0	333	—	—	—	none
821-64	fair	7.0	80-20	—	287	56	1.4	stearyl dimethylbenzyl ammonium chloride
821-65	fair	7.0	80-20	224	—	56	1.4	stearyl dimethylbenzyl ammonium chloride
821-74	fair	7.0	75-25	206	—	70	1.8	stearyl dimethylbenzyl ammonium chloride
821-74A	fair	7.0	75-25	206	—	70	1.8	stearyl dimethylbenzyl ammonium chloride
821-75	fair	7.0	75-25	—	284	70	1.8	stearyl dimethylbenzyl ammonium chloride

*dimethylol cyclic ethylene urea
**Catalyst A, Rohm and Haas Co
***Where used, the softener was present at the level of 80 g/two liters.

bottom squeeze rolls. Squeezing is accomplished by weighted rubber-covered rolls riding on the two stainless-steel bottom rolls. In this work, the total weight on the yarn in each of the squeeze rolls was 26.5 lb.

The slashed yarn is dried in a thermostatically controlled, electrically heated, recirculating air oven. The yarn makes five vertical passes over positively driven rolls. The yarn then passes over a rubber-covered delivery roll and is delivered to a spool.

The slasher is powered by an electric motor equipped with a variable-speed Graham transmission. Power is transmitted to all sections of the slasher by a combination of gear and chain drives.

Compositions of the treating baths are given in Table I. Treatments were applied at room temperature and were dried and cured at 275°F. The 12 ends were treated at the rate of one and one-third yards per minute. At this rate, drying and curing of the yarn was completed in three minutes. Thereafter, yarns from the slasher were wound on perforated take-up spools and were neutralized and rinsed by pumping the neutralizing solutions and rinse water through the yarns on the take-up spool. Finally, the treated yarns were dried by a second pass through the dry box of the slasher. No stretch was applied to the yarns during the the entire treating operation. Where lubricating agents were used, they were applied from the slasher size box prior to drying.

TEST PROCEDURES (YARN)——

Pickup. Because it is not possible to dissolve most synthetic latices, an indirect method of determining pick-up was used. The weight of the treated yarn was compared to the weight of the untreated yarn, after conditioning for 24 hours at 70°F and 65% relative humidity. Sheets of 12 yarns, three yards long were weighed for this purpose. To minimize error, which is rather large in this method, a standard tension was applied to the yarns before they were cut. It was not practical to measure wet pickup in this work because of the excessive amount of time that would have been required.

Breaking Strength and Elongation. Tests were made on the Scott-IP-4 Serigraph on single ends. Results given in Tables II and III are averages of 12 to 15 individual tests. A carriage weight of 20 lb was used and the load was applied at a constant rate so that the full weight of the carriage was effective within 30 sec.

TEST PROCEDURES (CARPETS)——Carpets were prepared from treated and untreated yarns on a twelve-needle tufting machine. The backing for the carpets was a burlap fabric obtained from a leading tufted carpet manufacturer. The cut pile was one-half inch high and conformed to the density of high-grade commercial cotton carpets. All carpets were dyed in accordance with instructions given by a leading manufacturer of tufted carpets.

DYEBATH——

Material	Constituents, % based on wt of carpet
Tetrasodium pyrophosphate (TSPP)	0.5
Sodium alkylarylsulfonate	1.0
Direct dye (various)	0.3
Sodium chloride	0.1

DYEING AND FINISHING PROCEDURE——

1) Prepare a solution of TSPP and sodium alkylarylsulfonate and raise temperature to 100°F.

2) Wet out carpets for five minutes.

3) Add dye, stir, and raise temperature to boiling point.

4) Boil for 15 minutes.

5) Add sodium chloride slowly with stirring.

6) Boil for 15 minutes.

7) Rinse carpets thoroughly in cold tap water.

8) Fluff the pile on the damp carpets by snapping the ends.

9) Dry at 212°F.

10) Apply a latex backing compound to the back by brushing and cure at 300°F for 15 minutes.

SEWABILITY OF YARN——The sewability of the yarn was graded as follows:

Sewability	*Number of yarn breaks*
None	More than 10 for each square inch of carpet
Very poor	Five to 10 for each square inch of carpet
Poor	Two to five for each square inch of carpet
Fair	One to two for six square inches of carpet
Medium	One to two for each square foot of carpet
Good	No appreciable time lost due to yarn breaking

EVALUATION OF BEHAVIOR OF TREATED PILE CARPETS——Methods and equipment similar to that described by Schiefer (3) were used to evaluate the compressional resilience of the treated carpets. Swatches of carpet were conditioned to equilibrium at 65% RH and 70°F before they were tested.

The initial thickness of each carpet was taken when the pressure on the foot of the compressometer was increased to 0.1 psi. Additional thickness readings were taken at pressures of 0.2, 0.35, 0.5, 0.75, 1.0, 1.5, and 2.0 psi for the loading and unloading cycles. Graphs were made of the pressure in psi versus thickness in inches and the areas under the deformation and relaxation curves were measured with a planimeter.

Resilience of the test specimens was taken as the ratio of the area under the relaxation curve to the area under the deformation curve.

Standard thickness was the thickness of the carpet at a pressure of 1.0 psi, taken during deformation.

Compressibility was calculated at two different pressure ranges. The first value for compressibility was calculated in a pressure difference range of 0.1 psi to 0.5 psi as follows:

$$\text{Compressibility}_1 = \frac{T_1 - T_2}{T(L_2 - L_1)}, \text{ where}$$

T_1 = thickness at 0.1 psi
T_2 = thickness at 0.5 psi
L_1 = 0.1 psi
L_2 = 0.5 psi
T = thickness of the specimen at 0.35 psi

$$\text{Compressibility}_2 = \frac{T_2 - T_3}{T_s(L_3 - L_2)}, \text{ where}$$

T_2 = thickness at 0.5 psi
T_3 = thickness at 1.5 psi
L_2 = 0.5 psi
L_3 = 1.5 psi
T_s = standard thickness

Percent recovery of the carpet pile was determined from measurements taken for compressibility and resilience, as follows:

$$\text{Percent recovery} = \frac{\text{thickness of carpet at 0.1 psi during recovery}}{\text{thickness of carpet at 0.1 psi during deformation}} \times 100$$

Use tests. Carpets were placed in a hallway usually subjected to heavy traffic and were vacuum cleaned daily. The carpets were examined at weekly intervals for one month.

DISCUSSION

EFFECT OF TREATMENTS ON SEWABILITY OF COTTON YARN——Treatments to reduce matting of cotton carpets were applied to the yarn before it was sewed to burlap backing. It is obvious that the first requirement of carpet yarn is good sewability. Yarns treated with formulations containing 20% solids were too stiff to sew. The stiff yarn bunched in front of the needle eyes as the needles passed through the burlap backing and caused the yarn to break. Only yarns treated with Formulas 821-44 and 821-45 (Tables I, II and III) could be sewed, although with great difficulty, and were made up into carpets. The results obtained on the carpets are included only for comparative purposes. It is not likely that this yarn could be used on commercial machines.

In subsequent experiments, the solids content of the treating solutions was reduced from 20% to 5%. Even at this concentration of solids sewability was difficult. Yarn treated with Formula 821-48 could not be used on the laboratory carpet ma-

TABLE II
Results of tests on treated yarn

Formula no.	*Pickup* %	*Strength* lb	*Elongation* %
Untreated	—	13.4	9.6
821-36	17	14.0	7.9
821-37	15	7.3	4.5
821-38	15	8.2	4.8
821-39	16	8.7	5.0
821-40	16	8.7	5.6
821-41	18	9.4	5.7
821-42	21	9.9	6.1
821-43	17	11.1	7.2
821-44	15	12.4	7.6
821-45	19	13.4	7.9
821-46	7	8.1	5.9
821-48	1	11.9	8.1
821-49	4	11.4	9.4
821-50	11	10.6	7.7
821-51	12	10.7	8.3
821-52	9	10.6	7.5
821-53	7	10.5	7.9
821-54	7	11.0	8.3
821-55	—	—	—
821-56	9	11.2	8.2
821-57	8	11.7	8.4
821-58	10	10.0	7.1
821-59	9	10.5	7.0
821-60	12	9.6	6.8
821-61	9	9.5	6.9
821-62	7	9.1	6.5
821-63	12	13.7	10.6
821-64	8	12.3	8.2
821-65	7	12.0	8.3
821-74	6	11.2	8.1
821-74A	6	11.4	7.6
821-75	6	12.3	8.1

TABLE III
Results of tests on carpets made from treated yarn*

Formula no.	*Standard thickness inches at 1.0 psi*	*Compressibility sq in/lb* 0.35 psi	1.0 psi	*Resiliency* %	*Recovery* %
Untreated	0.47	0.27	0.14	23	85
821-44	0.45	0.37	0.24	14	75
821-45	0.47	0.37	0.19	18	78
821-49	0.46	0.28	0.15	23	84
821-51	0.56	0.21	0.09	20	87
821-52	0.50	0.16	0.14	21	87
821-53	0.51	0.22	0.13	17	86
821-54	0.56	0.32	0.19	22	82
821-55	0.55	0.27	0.10	17	85
821-56	0.52	0.27	0.14	19	84
821-57	0.51	0.23	0.17	16	82
821-58	0.54	0.24	0.14	15	84
821-59	0.51	0.33	0.25	10	71
821-60	0.50	0.27	0.20	17	80
821-61	0.51	0.27	0.23	21	80
821-64	0.51	0.26	0.18	14	81
821-65	0.57	0.19	0.11	14	87
821-74	0.51	0.26	0.19	20	82
821-74A	0.47	0.36	0.18	6	78
821-75	0.46	0.32	0.24	18	80

*The compressibility, resiliency and recovery were obtained on a compressometer which had a plunger area of 1.86 sq in.

chine. With the addition of a softening agent, sewability was improved slightly, and a carpet was prepared. With the addition of softening agents, it was possible to prepare carpets from yarns containing as much as 10% solids (Formulas 821-51 and 821-52). A polyalkyleneglycol was the most effective of the softeners tried.

RESULTS OF TESTS ON CARPETS MADE FROM TREATED YARNS——It has been observed that, when carpets made of untreated cotton yarns are dyed, the twist in the individual yarns opens up and the fibers of adjacent yarns become entangled. This results in a slight reduction in pile height. On the other hand, treated yarns do not lose their twist during wet processing and individual fibers of adjacent yarns do not mat together.

Although carpets made of untreated yarns appeared to be felted and were softer to the touch, carpets made of treated yarns had a pebbled texture and resisted deformation. For service tests, carpets measuring 24 by 40 inches were prepared and finished as described previously. In addition, a portion of each carpet was sprayed with a 4% solution of colloidal silica.

In Table III, it can be seen that there is practically no improvement in resilience or in recovery from deformation when treated carpets are measured with a compressometer as described previously. An increase of the presser foot of the compressometer from 1.86 square inches to 2.83 square inches (see Table IV) also failed to give resilience values for the treated and untreated carpets that were consistent with a subjective evaluation of the test specimens.

At this point, it was found necessary to examine the test method more closely. Commercial carpets made by the tufting process were obtained on the open market. The construction of the carpets was as similar as it was possible to obtain. Resilience values and recovery values were determined by the method previously described and were as follows:

Pile yarn	*Resilience, %*	*Recovery, %*
Cotton	21	70
90% Rayon—10% nylon	31	84
Nylon	19	80

The low value for the nylon carpet, as compared with the value for the rayon carpet, does not agree with a subjective evaluation of the pile materials.

To test this lack of agreement of subjective evaluation with compressometer measurements, several carpets were prepared for service testing*. The carpets, together with untreated controls, were placed in a hallway where more than 800 people walked over them. More than 95% of these people preferred the "feel" of the treated carpets. It should be pointed out that the shade of color of the treated yarn is not as bright as the color of the untreated yarn. And, of the 5% of people who preferred the untreated carpets, it appeared that their decision was influenced by the color of the carpets rather than by the "feel." These carpets were also tested objectively before and after the service test. After deformation of the treated carpets by the compressometer, the recovery of the treated pile was 70% and that of the untreated was 85%, obviously contrary to the subjective findings mentioned above.

Thickness measurements were taken at several marked spots on the treated and untreated carpets before and after the carpets had been in service. The average results were as follows:

Pile of carpets	*Thickness at 0.1 psi load, inches Before service*	*After service*	*Recovery %*
Untreated	0.66	0.56	85
Treated with Formula 821-59	0.71	0.65	91

It will be noted that the recovery of the untreated carpets was the same as the recovery obtained after deformation by the compressometer as described above. However, the recovery of the treated carpets after service testing was superior to both the untreated carpets and to the recovery of the treated carpets obtained with compressometer. In fact, the results were more nearly consistent with subjective evaluation.

A possible explanation of the lack of correlation between the compressometer test and subjective evaluation of the performance of pile carpets is as follows. During resilience tests on untreated carpets with the compressometer, the presser foot descends perpendicularly and makes a concave depression during deformation because the tufts are matted together at the top. Tufts located under the outer edge of the presser foot cause adjacent tufts at the periphery of the foot to be deformed also. There is little tuft-to-tuft slippage at the edge of the presser foot during deformation of untreated pile resulting in low tuft-to-tuft friction, and the deformed tufts can return energy to the presser foot during the retraction cycle without having to overcome friction. On the other hand, with treated pile, the presser foot makes a cylindrical depression. There is more possibility for slippage between tufts to occur at the edge of the presser foot, resulting in considerable tuft-to-tuft friction. The ends of fibers from deformed tufts may get caught in adjacent undeformed tufts. In order that the deformed tufts may return energy to the presser foot on the retraction cycle, they must overcome tuft-to-tuft friction. This is not always possible. As a result, the energy returned to the presser foot is low. However, potential energy in the treated tufts is high enough to cause the tufts to return to an upright position if the entangled fibers of the deformed tufts are relased or if tuft-to-tuft friction is reduced before the tufts acquire a permanent set.

When carpets are in service, tufts in the pile are deformed randomly as distinguished from the perpendicular force applied to the pile during tests with the compressometer. Random deformation, such as a heel brushing across the tops of tufts as it descends in an angular pattern, provides an opportunity for strain previously set up in deformed tufts to be released.

These observations led to an expedient which has given results that are more consistent with subjective evaluation. Carpet samples were deformed by passing them through the rolls of a laboratory model Butterworth padder. The roll pressure was

*Treatment 821-59 (Table I) was used for the treated carpets because of sewability, excellent hand and good appearance of the pile.

TABLE IV
Results of tests on carpets made from treated yarn*

Formula no.	*Sewability*	*Standard thickness inches at 1.0 psi*	*Compressibility sq in/lb 0.35 psi*	*1.0 psi*	*Resiliency %*	*Recovery %*
Untreated	good	0.42	0.29	0.14	25	87
821-49	poor	0.44	0.32	0.16	27	84
821-56	poor	0.47	0.32	0.16	25	83
821-59	medium	0.50	0.33	0.23	24	80
821-74	fair	0.46	0.42	0.20	25	80
821-75	fair	0.47	0.37	0.17	28	80

*The compressibility, resiliency, and recovery were obtained on a compressometer which had a plunger area of 2.83 sq in

TABLE V

Modifications of Formula 821-59*

A. VARIATIONS IN SOLIDS CONTENT

Formula no.	Treating bath solids, %	Latex-resin ratio	Formula (g/two liters) Polyacrylic latex	Butadiene-high acrylonitrile latex	Inorganic acid-forming Salt**	Pickup %	Strength lb	Elongation %	Sewability	Recovery of pile, % After 20 cycles	After 40 cycles
Untreated	(821 Series)						13.4	9.6	good	—	—
Untreated	(850 Series)						12.0	7.5	good	74	66
821-59	8.5	60/40	243	136	3.4	9	10.5	7.0	medium	97	91
850-28	10.0	60/40	294	160	4.0	17	9.9	4.7	fair	94	87
850-12	8.5	60/40	243	136	3.4	14	10.4	7.0	medium	94	90
850-29	6.0	60/40	175	96	2.4	12	10.2	6.0	good	95	86
850-31	4.0	60/40	117	64	1.6	15	10.8	6.9	good	89	88
850-45	2.0	60/40	59	32	0.8	11	12.5	8.9	good	87	90
			B. EFFECT OF EACH MAJOR COMPONENT								
850-49	10.0	0/100	—	400	10.0	19	8.0	4.6	none	—	—
850-48	8.0	0/100	—	320	8.0	11	7.4	4.4	none	—	—
850-47	6.0	0/100	—	240	6.0	6	8.5	4.9	none	—	—
850-37	4.0	0/100	—	160	4.0	4	8.4	4.3	good	80	75
850-46	2.0	0/100	—	80	2.0	2	9.8	7.1	good	78	72
850-53	10.0	100/0	490	—	—	15	14.3	10.1	good	97	83
850-25	6.0	100/0	294	—	—	13	12.4	6.4	good	84	86
850-51	4.0	100/0	195	—	—	9	12.6	8.5	good	82	76
850-50	2.0	100/0	100	—	—	8	12.6	7.7	good	74	69

*A final softener treatment was given all treated yarns. Polyalkyleneglycol was used at the rate of 80 g per two liters of solution
**Catalyst A, Rohm and Haas Co

10 psi and the carpets were passed through 20 times during each test. The test specimens were rotated 90° after each pass through the rolls. Thickness measurements were taken at 0.1 psi before and after the carpet specimens were deformed. The results obtained with the three commercially available carpets mentioned previously were as follows:

Pile yarn	Recovery, % Compressometer method	Padder method
Cotton	70	72
90% Rayon—10% nylon	84	95
Nylon	80	99

The recovery of these carpets is in line with subjective estimates of their performance.

Next, similar tests were made on laboratory-prepared carpet specimens with the following results:

Formula no.	Recovery, % Compressometer method	Padder method
821-53	86	66
821-54	82	71
821-58	84	66
821-64	81	91
821-74A	78	73
821-59	71	97
821-59*	71	91
Untreated	85	65

From these results, it can be seen that Formula 821-59 (Table I) gave a recovery value that was at least as good as that of the commercial rayon-nylon carpet. Moreover, continuing the deformation on the same sample (821-59)* resulted in very little loss of recovery.

Formula 821-59 was a 60/40 mixture of butadiene-high acrylonitrile latex and dimethylol cyclic ethylene urea (DMEU) resin; this formula contained 8.5% solids. The sewability of yarn treated with this formulation was "medium." In an effort to improve the sewability of this yarn, and, of course, to retain the excellent recovery ability of the pile made from this yarn, various modifications of Formula 821-59 were applied to cotton carpet yarn. The modified formulations are listed in Table V, A and B.

*Specimen treated with Formula 821-59 was given an additional 20 passes through the Butterworth padder for a total of 40 passes.

EFFECT OF VARIATIONS IN SOLIDS CONTENT———The data under this heading are given in Table V A. At the 60/40 ratio of latex to resin, a reduction in solids in the treating bath from 10% to 2% did not diminish the ability of the treated carpets to resist matting to any great extent when tested by the padder method of deformation. This is not surprising when it is noted that the pickup from the treating baths varied only from 17% for the 10% solids bath to 11% for the 2% solids bath. The high pickup from the low solids bath, and the fact that the pickup did not change correspondingly with the solids content, might be due to specific effects produced by the components used to treat the yarn, or to the method of applying the treatments. Also, since the pickup was determined by measuring the change in weight of the yarn under standard conditions, the moisture regain characteristics, and hence the apparent pickup, may have been different for yarns having different treatments. For example, the moisture regain may have been affected by variable amounts of softener retained by yarns with different treatments. The sewability of the yarn resulted in yarn that was rated "fair." Apparently, a pickup of about 10% solids at the 60/40 ratio of latex to resin is required for best results.

EFFECTS OF EACH MAJOR COMPONENT——A study was made of the effect of each component of the latex-resin mixture. In Table V B are the results of tests on carpet yarns treated with various concentrations of latex alone and with various concentrations of resin alone. The DMEU resin at high concentrations resulted in brittle yarn with reduced strength and elongation. The sewability of this yarn was so poor that it was not possible to prepare carpets. At lower pickups, 4% and 2%, the sewability was good, but the recovery of the rug pile was only slightly better than that of the untreated control.

Yarn treated with latex alone gave good sewability at all concentrations and in addition was stronger than untreated yarn. Pickups of 9% and higher gave fairly good recovery values on carpet pile, and at a pickup of 15% (Formula 850-53), the value —97%—was as good as for Formula 821-59.

SOILING TENDENCY———When a carpet containing alternate strips made from treated and untreated yarns was subjected to use tests, it was found that the treated yarn became more soiled than the untreated yarn.

CONCLUSIONS

1) The resiliency of cotton pile carpeting was significantly improved by treatment of yarn with latex or latex-resin mixtures.

2) Pickups in excess of 15% resulted in yarn that was too stiff to sew. At this level of solids, sewability was improved by the addition of a softener or lubricant. However, any level of treatment had some adverse effect on sewability.

3) Yarns treated with latex or latex-resin formulations did not lose their twist during wet processing, nor did individual fibers of adjacent yarns mat together.

4) Tests that are widely used to measure resilience or recovery from deformation of carpets did not correlate with subjective evaluation of carpet quality. A new method of test was found to give more consistent results.

5) Formula 821-59, containing 8.5% solids of a 60/40 mixture of butadiene-high acrylonitrile latex and DMEU resin, gave the best results of all latex-resin formulations. Formula 850-53, a 10% solution of this latex, gave the best results for formulations containing latex or resin alone. Comparison of 821-59 with 850-53 shows that whereas both formulas resulted in carpet that had good initial recovery, that is, after 20 cycles of the modified test, sample 821-59 was markedly superior after 40 cycles.

6) In the method of yarn slashing that was used, formulations that contained latex resulted in high pickups on yarn regardless of concentration in the size bath. A bath with 10% solids gave a 17% pickup, whereas a bath with 2% solids gave an 11% pickup. The reasons for this are not clear.

7) Carpet made from the treated yarn had a greater tendency toward soiling than carpet made from untreated yarn.

ACKNOWLEDGMENTS

The authors wish to acknowledge the valuable assistance of Jeanette Esslinger, Mary Chapman, Peggy Harrell, and Josiah E Smith Jr throughout the course of this project.

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PATENT DIGEST

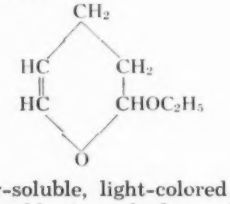
PAUL WENGRAF

SHRINKAGE CONTROL OF CELLULOSE———Acetals Derived from Glutaraldehyde Applied G,2,04

U S Pat 2,885,443 (Quaker Chem Prod——Kress ——May 5, 1959)

Glutaraldehyde may be applied to cellulose in an acid-catalyzed reaction at moderately elevated temperatures. It has been found previously (cf digest USP 2,826,514 in ADR of July 13, 1959, pg 57) that cellulosic textiles may be stabilized to laundering by this treatment. A serious disadvantage of this reaction, however, is the severe odor of the aldehyde, which causes lachrymation and precludes its general use.

It has been observed that the acetals of glutaraldehyde and particularly products obtained from the aldehyde's derivatives, eg, 1-ethoxy-2-3-dihydropyrane



are water-soluble, light-colored solids, obtainable in anhydrous form. The alcoholic component is a glycol or a diglycol, a blend of several polyalcohols (preferably of low molecular weight), or mixtures thereof with lower monoalcohols.

Example: An acetal was obtained by refluxing diethyleneglycol, 2-ethoxy-2-3-dihydropyrane, and methanol in the presence of a catalytic amount of toluene sulfonic acid. Cotton sheeting was padded with a 10% aqueous solution of the acetal and 2% $MgCl_2$, dried at 180°F, and cured at 300°F. The fabric reportedly showed good crease and shrink resistance and no chlorine retention.

Among the references cited by the Patent Office:

U S Pat 2,350,350 (Du Pont/1944) describes the reaction of ethylene glycol with formaldehyde to produce high-molecular glycol formals, which may be used as softening agents, sizing or textile finishing agents, dispersants, etc.

Brit Pat 718,502 (Distillers Co / 1954): Aliphatic dialdehydes were found to condense with polyhydric alcohols (eg, pentaerythritol) or with ethylene oxide to give plasicizers for cellulose acetate.

•

GAS-FADING INHIBITION ——Derivatives of Aminopropionitriles Used G,1

U S Pat 2,888,314 (Rohm & Haas——Matlin, Luskin ——May 26, 1959)

Cellulose acetate dyeings made with certain anthraquinone derivatives, such as 1:4-diamino anthraquinone, are known to be normally unstable to the combustion products of coal (gas). Such dyeings reportedly can be made more resistant to gas fading by the presence of N-substituted aminopropionitrile of the formula $RNHCH_2CH_2CN$, wherein "R" may be phenyl, benzyl, cyclohexyl, or alkyl of eight or more C-atoms. Tertiary alkyls, eg, tert-octyl, are preferable.

These compounds, in contrast to simple amines, were found to be resistant to drycleaning and washing. It has been observed, however, that the resistance to drycleaning decreases when the alkyl chain is over 15 C.

These water-insoluble products may be incorporated in the cellulose acetate spinning dope or otherwise applied before, during, or after dyeing from an emulsion prepared with a nonionic agent of the Igepal type.

Example: A cellulose acetate fabric was introduced into an 85°C bath containing 0.05% (bw of the bath) of tert-octylamino propionitrile emulsified with tert-octyl phenoxy polyethoxy ethanol and the dyestuff 1-monomethylamino-4 (2-hydroxy ethyl) amino anthraquinone dispersed in triethanolamine oleate. After an hour's agitation the exhaustions of the inhibitor and of the dye were found to be complete. The inhibitor reportedly quadrupled the resistance to gas fading.

Among the references cited by the Patent Office:

U S Pat 2,017,119 (Celanese / 1935): Colorless aralalkylamines are incorporated into textiles and other materials to improve the resistance to acid gas fumes .

U S Pat 2,539,212 (Gen Aniline / 1951): Gas fading is prevented by the application of a diarylated polyalkylated polyamine.

U S Pat 2,873,773 (BASF / 1957): Dicyclohexylmethane substituted in the nuclei by cyanomethylamino groups is claimed to be an acid gas-fading inhibitor.

French Pat 1,070,680 (BASF / 1954) is similar to U S Pat 2,873,773, but offers a long list of inhibitors, characterized by cyanoalkylated amino chains as substituents, to be used as gas-fading inhibitors.

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38th National Convention———

RECENT DEVELOPMENTS IN FINISHING OF BLENDS*

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This paper discusses the production of cellulosic-hydrophobic fiber blended fabrics to meet the ultimate in performance standards demanded by a trade fraught with sales gimmicks. A comparison of processing by means of the outstanding developments in resin precursors, with methods of increasing resistance to abrasion, odor, yellowing, chlorine damage, consumer washdown of hand, and storage deterioration is presented. Catalysts and buffers are noted along with details of their use in mills to affect yield of better-quality goods. Compounding of chemical additives and resins to give higher tensile and tear strength, better adhesion of resin to hydrophobic fiber, and more stability to processing baths tend to help the finisher avoid pick-off, spots, and tailing-off of finish. Examples of use of alkyds, latices, and plasticizers with the more common type of monomeric and polymeric resins are given. These examples show the variation in vital character of hand, and the removal of chance incompatibility of additives necessary for multi-functional fabric end-use. Also noted is the tendency toward pre-mercerization of cellulosic blends prior to bleaching, with use of more lubricant in bleaching to eliminate "memory marks" in the finished piece. A resume of methods used in better bonding of resin coating is included.

INTRODUCTION

WHEN we consider the giant strides of the chemical industry toward almost unbelievable heights of achievement in recent years, we may pause for a moment and take cognizance of our own altitudes and attempt to see if the textile finisher has gained his share of credit for his efforts and successes. Or has the terrific strain of meeting production schedules kept him from producing more exotic creations within the practical methods at his disposal? This survey of developments in finishing of blended fabrics is designed to review for you some of the steps the industry is taking to keep abreast of the times in products and technique. It is hoped that this discussion will enable you, as finishers, to determine whether you are ahead or behind your competition.

I must preface my remarks by acknowledging that there are probably many new developments which are in the making at present. However, I will try to present a broad picture of products and procedures which are in current mill production, rather than take the limited time at hand to go into chemistry of so-called laboratory curiosities, which may or may not ever produce results in a practical way in the finishing department.

You need not be reminded specifically of the part played by the finisher in producing goods which have to sell and resell under advertising tags such as "shrink-resistant," "easy laundering," "little or no ironing," "quick drying," "water repellant," or "mothproof" and many others. Sometimes advertising slogans often succeed in dissipating our efforts to achieve higher plateaus in our search for the ultimate. We must do more than live up to our advertising tags and catch-phases by educating ourselves and our customers that we strive to provide improvements in quality which will, in turn, enrich the lives of the consumer by adding lasting pleasure and comfort.

*Presented October 8, 1959 at the 38th AATCC Convention, held in Washington, DC

DISCUSSION

The five basic considerations of the finisher are to produce fabrics which have:

a) Visual appeal
b) Wear resistance
c) Ease of maintenance
d) Comfort
e) Price.

At times we feel that we may have reached the zenith in each of these categories with the exception of cost or price. Competition is constantly beating down price until we sacrifice one or another of the considerations to produce at a lower cost. When quality suffers in a few mills, the whole industry is given a black eye by the consumer. The president of one of our largest finishing houses has often stressed the point that there is always room at the top for a quality item without sacrifice of price. This is why we constantly try to raise our standards to higher and higher levels.

The creation of purely synthetic fiber "wash-and-wear" styles and successful sales campaigns along with enthusiastic buyer reaction has forced the production of numerous blends of cellulosic fibers with hydrophobic fibers. Both cotton and regenerated cellulose are being intimately blended with Dacron, nylon, Arnel, Orlon and many other synthetics. In all cases, the intimacy of blend does not overcome some of the tendencies of the cellulosics to shrink, become distorted, and deaden the resiliency of hand. It is the finisher's problem to use materials in his formulations which will counter the loss in appeal that may be the result of too great a proportion of cellulose in the blend.

In discussion of the methods and materials at his disposal, one can review current interests in resin precursors (both surface and internal), catalysts, buffers, special surface effects, plasticizers, wash-down of hand, test procedure and, finally, bonding technique for industrial fabrics.

Most widely used of the currently available resin precursors are: urea-formaldehyde, normal and modified melamine-formaldehyde, cyclic dimethylol ethylene urea, triazone, triazine, epoxy, acetals and a recent additional development identified only as cyclic formaldehyde. Failure of some of these to meet consumer demands has led to research on exotic mixtures of several of the resins mentioned. Volumes have been published regarding the successes or shortcomings of most of these reactants. Great progress seems to be advanced in use of ethylene urea blended with triazones wherein a synogism is very evident; however, a pronounced step forward is being made by resins which have not been publicly identified except in a very broad generic class, which give outstanding strength, crease-angle resistance, durability of shrinkage control, no yellowing or odor, and no damaging chlorine reactivity. These resins also are high in soil resistance. Table I shows a comparison between this type, labelled NDC, and ethylene urea and mixture of ethylene urea-triazone.

Because there are so many possible variations in blended precursors, many companies are revising their concepts of catalyst requirements. Notable progress has been made in this respect with information being passed along to the public domain. Irvine et al (*1*) have reported on an acceptable method of catalyst and buffer using magnesium chloride and aluminum chloride effectively at low temperature. This system has been found particularly useful with the acetals. Mosher (*2*) has reported on minimum-maximum percentages of zinc nitrate catalysts for optimum efficiency with ethylene urea and also acetylene diurea.

Mosher has recently investigated the use of heavy organic salts to supplement the action of zinc nitrate with a variety of resins. His work has shown high strength yields in production of "wash-and-wear" cottons and cotton blends. The tensile and tear strength of fabrics containing cotton are impaired by thermosetting urea- and melamine-formaldehyde-resin finishes. Percentage of loss is considerable, generally amounting to 33% to 40%. It has been found that the loss of strength may be reduced without perceptibly impairing the "wash-and-wear" properties of resin-treated cottons and cotton blends by use of buffering agents. Although a number of heavy metallic salts were found suitable for the purpose of decreasing strength loss, they had drawbacks of side effects, such as odor development and yellowing at

TABLE I

Comparison of nondamaging-chlorine-type cyclic formal resin with DMEU and also DMEU-triazone resin (80 x 80 bleached cotton)

		Total crease angle recovery				Strength			
			After five comm washes	Shrinkage after five comm washes				After five comm washes plus AATCC 69-1958 bleach & scorch	
Sample	Treatment	Original		W	F	Original W	Original F	W	F
1)	Unfin	159	—	−6.2%	−2.0	52	45	49	41
2)	15% DMEU, 0.75% Zn NO_3	281	270	−1.5	−0.5	42	32	33	26
3)	7.5% DMEU, 7.5% triazone, 0.75% Zn NO_3	275	266	−1.2%	−0.5	41	30	38	26
4)	15% cyclic formal NDC, 0.75 Zn NO_3	280	275	−0.9	0.0	43	33	42	34

TABLE II

Protective action of metallic carbonate-oxide buffer in resin finishing (Fabric: napped cotton)

Finishing Solution			Strength after finishing		Strength after five comm washes plus AATCC 69-1958		Crease angle recovery
Resin	Catalyst	Buffer	Warp	Filling	Warp	Filling	W & F
0	0	0	33#	28# (Orig)	29#	29#	212
10% DMEU	0.5 Zn NO_3	0	22#	16#	18#	14#	277
10% DMEU	"	5%	27#	23#	25#	21#	268
10% NDC cyclic-formal	"	0	21#	14#	20#	15#	279
10% NDC cyclic-formal	"	5%	28#	23#	27#	22#	272
(5% Triazone (5% DMEU	"	0	19#	14#	20#	15#	274
(5% Triazone (5% DMEU	"	5%	27#	24#	27#	23#	267

TABLE III

Influence of metallic buffer as component of "wash-wear" finishing solution on cotton fabrics (80 x 80 cotton)

Finishing solution				Strength		Angle recovery	
Sample	Resin	Catalyst	Metallic buffer	Warp	Filling	Warp	Filling
1	15% DMEU	0.75% Zn NO_3	0	34	25	145	136
2	15% DMEU	"	5%	40	29	143	137
3	15% DMEU	"	10%	42	31	144	135
4	15% Methylated UF	"	0	33	25	133	129
5	15% Methylated UF	"	5%	39	30	131	133
6	15% NDC cyclic formal	"	0	36	26	141	136
7	15% NDC cyclic formal	"	5%	39	28	140	138
8	0	0	0	55	45	78	81

Conclusion—The presence of oxide forming buffer in the finishing bath produces a stronger "wash-wear" fabric without inhibiting the angle recovery. Improvement in strength, approximately 20% stronger when used with DMEU or with methylated UF; about 10% stronger with NDC cyclic formal.

TABLE IV

Influence of metallic buffer on susceptibility of resin-treated cotton fabrics to damaging chlorine retention after home laundering (Fabric: 80 x 80 cotton)

Sample	Finishing solution: Resin	Catalyst	Metallic buffer	Strength after rinse: Warp	Filling	Strength after 20 home washes + AATCC 69-1958: Warp	Filling
9	10% DMEU	0.75% $Zn(NO_3)_2$	0	34	25	28	21
10	15% DMEU	"	5%	40	29	38	27
11	15% DMEU	"	10%	43	28	38	30
12	15% Methylated UF	"	0	34	25	16	12
13	15% Methylated UF	"	5%	40	29	36	26
14	15% TMAD	1.5% $Zn(NO_3)_2$	0	33	25	19	14
15	15% TMAD	"	5%	39	29	36	27

TABLE V

Influence of metallic buffer on susceptibility of resin-treated cotton goods to damaging chlorine retention after compressive shrinkage washes (Fabric: 80 x 80 cotton)

Sample	Finishing Solution: Resin	Catalyst	Metallic Buffer	Strength after finishing: W	F	Strength after one compressive shrinkage wash plus AATCC 69-1958: W	F	Strength after five compressive shrinkage washes plus AATCC 69-1958: W	F	Strength after ten compressive shrinkage washes plus AATCC 69-1958: W	F
16	10% DMEU	0.75% $Zn(NO_3)_2$	0	33	25	30	24	11	7	6	3
17	10% DMEU	"	5%	39	28	38	27	36	26	33	23
18	10% DMEU	"	10%	43	28	39	27	37	27	34	23
19	15% Methylated UF	"	0	33	24	8	6	—	—	—	—
20	15% Methylated UF	"	10%	39	29	37	25	25	14	21	10

Conclusion: Samples finished with resin and buffer were much more resistant to bleach-scorch damage than materials finished with resin alone.

TABLE VI

Effect of pH variation on strength of cotton finished with DMEU-triazone when subjected to test of loss due to AATCC bleach 69-1958 (Fabric: 80 x 80 cotton)

Sample	Bleach pH	Strength loss
1	9.7	60.1%
2	10.2	30.0%
3	10.8	17.3%
4	11.5	9.9%
5	12.0	8.1%
6	12.5	4.5%

normal curing temperatures. Mosher reports a blend of trade name buffers which subsequently form a system of oxides and carbonates in the cellulosic fiber which does an excellent job as to inhibiting strength loss and does not develop odor or color. Mills have reported this complex buffer system is effective in rendering "wash-and-wear" cotton goods less susceptible to bleach-scorch damage. The metallic salt tends to neutralize any acidity liberated from chlorinated finishes during ironing and thus affords protection against bleach-scorch damage. This protection is but transient although the metallic oxides are resistant to removal after repeated home launderings and even hot alkaline washing. They are susceptible to acidic removal by high qualities of sour in some processes of commercial laundering. Hence, oxide-carbonate buffer is of value only on those types of fabrics exposed to home laundering. This activity is expessed as interesting where zinc nitrate is used as catalyst, seems to have the additional value of cutting the percentage of strength loss from unfinished to finished goods, and can be used with a variety of resins.

Table II illustrates the protective action of carbonate-oxide buffer on napped cotton fabric and the influence on performance after washing.

Table III illustrates the influence of carbonate oxide buffers on 80 × 80 cotton fabric with variation of quantity used.

Table IV indicates influence of buffer on susceptibility of resin-treated 80 × 80 cotton to chlorine damage after home laundering.

Table V shows influence of buffer on damaging chlorine after compressive shrinkage washes.

These tables show buffer action on 100%-cotton goods. All-cotton fabric was used in order to reduce the test variables that might be present if a synthetic-cotton blend was used for test purposes.

One of the foremost problems of the finisher in "wash-and-wear" production is the tendency to wash down in hand, not only by the consumer, but also in his own back-wash after curing. This is caused by poor adhesion of surface or bulking resin to the hydrophobic fiber in the blend. Our survey has indicated two notable approaches to counter this phenomena:

1) The use of modified alkyd resin, which tends to either cross-link with the reactant resin present in the mix, or to possibly continue to polymerize during the cure. This system presents a problem in compatibility in that metallic catalysts cannot be used; however, amine hydrochlorides are available which do not cause instability of the alkyd dispersion or solution. A wide range of alkyds of the modified glycerol-phthalic anhydride type is available, having good resistance to yellowing. Alkyds have good adhesion to smooth hydrophobic fiber when used with melamine-formaldehyde resins. Hot calendaring will cause good flow with very little trend toward mark-off.
2) The use of acrylic emulsions along with reactant precursors. In this case metallic catalysts for the formaldehyde donors may be used; however, it is a case of necessity that glycerine and silicones be used as softeners along with the pad bath to prevent pick-off of the drying

acrylic resin from the top pad roll. Some mills have arranged a circulation pump on the finish mix where the bath can be dripped from a spray tube just off-center on the ingress side of the top pad roll. This enables the finisher to keep the roll free of drying resin skim and inhibits tail-off of the bath. Bath life can be maintained for several hours. The use of acrylic resin in combination with reactants makes it possible to give good body and resiliency to the fabric and at the same time produce goods that can be hot pressed to a semipermanent crease by the cutting trade, as is desired for slacks finish.

"Memory marks", or rope marks often show up after cotton blends are finished and are receiving considerable attention, especially on high-quality goods. This condition seems to be accentuated in direct ratio to the quality of the shrinkage control and crease-angle recovery. Some of the mills have abandoned former bleaching techniques and are either bleaching in open width or are partially mercerizing before the bleach. Detergents with a high degree of residual lubricant quality are used as auxiliaries in the process.

Silicones continue to exhibit increased use not only as an aid to water-borne spot resistance but also as softeners. New silicone catalysts are available for faster curing and also for curing in the presence of moderate amounts of alkali as is necessary when alkyds are used on sail cloth for special hot-calendar finishes. Silicones can be varied to give almost any desirable hand from soft and slick on Dacron blends to firm and dry, such as necessary on rayon-acetate blends. Most finishers are using silicone softeners alone and in conjunction with polyethylenes as top softeners. Fewer rejects for mark-off are in evidence where top softening is practiced, hence the extra effort is justified.

In the finishing of industrial fabrics, renewed interest is shown by some plants using pretreatment technique prior to coating with latices. Powerful nonionic rewetting agents are used in some instances to cause strike-in of the coating. On the other hand, where construction is less dense and the need arises to inhibit strike-through but at the same time effect a tight bond between fiber and coating, cationic mordants are used as a pretreatment. The base fabric is then dried and coated with anionic dispersions of polymers. The latter practice gives a firm bond which does not allow the coating to be peeled away during use and also allows a smooth coating without skips or resists.

In connection with my survey in various mills on the subject of resins and chlorine retention one outstanding fact has been noted among many of the chemists. This concerns the inability of different laboratories to check each other on chlorine bleach damage to cellulosic blends. Our Association allows a leeway in pH of chlorine bleach of 9.8 to 12.5. One prominent member of the Association and technical director of one of the large Southern mills has shown that the prescribed test will give as much as a 60% fabric strength differential when testing ethylene urea-triazone blend on 100%-cotton goods, between the means and extremes of pH (See Table VI). Other laboratories have verified the fact that percentage will vary according to the resin being tested; however, it is certainly food for thought toward establishing a more rigid acceptance test.

Before we are satisfied with our orbit, let us consider again the altitude we have reached where we can survey our immediate horizons but keep our sights aimed at achieving more lofty goals in the not too distant future.

ACKNOWLEDGMENT

I would like to acknowledge with thanks the helpful discussions during preparation of this paper of James Greer and J D Long of Burlington Industries, Brad Holland of Cannon Mills, and H H Mosher of Arkansas Co, Inc.

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Piedmont Section

Walter L Bogan (J)

South Central Section

Roy C Lindsey
Frank A Hirsch *

Washington Section

Mary B Spicer (A)

WESTERN REGION

Mid-West Section

Albert Bartovics
Erwin W Roedel (J)

Pacific Southwest Section

Walter A Wilson (A)

STUDENT CHAPTER

Bradford Durfee College of Technology

Charles W Ashworth Jr (S)
Myron G Drewniak (S)
Antonio Sardinha Jr (S)
Herbert B Smith (S)

UNCLASSIFIED

Karl J Seyfried
James P Langwill (A)
Fernando Garcia Orozco (A)

38th National Convention ——

THE CONSUMERS' REACTION TO "WASH-AND-WEAR" *

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New York, NY

Returns to the retail store do not show that the average consumer is dissatisfied with "wash-and-wear" merchandise, but the individual consumer voices a completely different opinion. The average user tends to accept the "wash-and-wear" promotion knowing that she will need to press the garments after they are laundered. However, she does find most fabrics easier to iron.

Among the complaints voiced by individuals are these: the garments do not stand up to the claims made for them; some whites retain chlorine, becoming yellow and/or tender after laundering; soil is hard to remove; fabrics tear and wear out easily; the finish washes out; puckering at seams gives garments a poor appearance, particularly after they are laundered.

Improvements in application of resin and type of resin used have been made in the field of finishing. Many garment manufacturers have learned how to stitch seams so that the puckering problem has decreased. Even the promotional claims as to the necessity for ironing have been tempered.

There is a demand for good "wash-and-wear" and more of it is finding its way into the market.

INTRODUCTION

WOULD you want your wife to appear in a complete garment that looks like the left side of this one? The smoother appearance of the right side of the garment shows the improvement that is the result of pressing. Would you want your daughter to wear a dress that looked like this? Would you want to wear a shirt and slacks that look like these? All these garments were advertised as "Wash-and-Wear", "No Ironing Needed". What would you say?

As sales of "wash-and-wear" merchandise have continued to increase and retail stores receive few actual returns, it appears that the customer is satisfied with this merchandise. But comments made by the individual consumer show that she is not so happy. Has she accepted this type of merchandise as being easier to handle, even though she is not completely satisfied with its performance?

To gather information for this presentation, I have talked to many retailers, magazine editors, home economists, homemakers as well as friends and acquaintances. They have been most generous with their comments. To each of these I want to say, "Thank You." I appreciate, too, the garments contributed by various people for use as illustrative material. The majority of my comments will be concerned with the resin-finished cottons in the apparel field.

DISCUSSION

During my search for the consumer's opinion on "wash-and-wear", I made some remarkable discoveries. For instance, do you know that there are people who can't believe that the garment they have is "wash-and-wear?" Recently, a young man showed me as suit coat, with a "wash-and-wear" label in it, that he had purchased several years ago. He asked if he could really wash it. Up to this time he has had it drycleaned because he did not believe that it could be laundered satisfactorily. Many women are just as disbelieving as this young man. For example, one friend was surprised that she could launder a pleated dress labeled "wash-and-wear" and wear it with no pressing afterwards.

The woman today wants things easier. She is so glad to be free of this ironing chore that she is willing to follow the longer, more complicated washing methods often suggested on the hang tags. She is willing to "take a chance". But, she isn't very happy when the resultant product does not meet her expectations. The "wash-and-wear" principle has become so popular because the average woman dislikes ironing more than almost any chore she has to do. To the housewife, anything that signifies that she will have less work and more freedom requires some consideration. This is particularly true of the woman with small children.

THE HOME SEWER —— The home sewer is interested also in decreasing the time she spends caring for the garments she makes. When she shops in the piece goods departments, what criteria does she use in choosing cotton fabrics? Her first decision is one between a "wash-and-wear" cotton and a conventionally finished cotton. She may want a resin-finished cotton, but how is she going to know which of the myriad of offerings will give the best performance? Just because one label reads "Wash and Wear—No Ironing Needed" does not mean that that fabric will be better than one that reads simply "Easy to Care For". The consumer has no basis for choosing one over the other, except her past experiences. She finds that it is difficult to purchase a quality cotton without a "wash-and-wear" finish, the performance of which is often in doubt.

Several home sewers, to whom I have talked, complain that resin-finished cottons are off-grain. All sewing pattern guides instruct the home sewer to straighten the grain of the fabric before cutting out the garment. With Sanforized or mill-finished goods, a home sewer could usually pull and adjust a fabric so that it was satisfactory for use. The resin finish on cotton fabrics makes it difficult to adjust when it is finished off-grain. College instructors complained about this problem at a recent convention of the American Home Economics Association.

Other complaints center around the difficulty of making bound buttonholes and pressing seams flat. Some home sewers find that treated cottons are stiff, uncomfortable and hot, particularly during the summer.

ADVERTISING CLAIMS —— Would you say this garment is really "wash-and-wear"? I don't think many of us would consider it satisfactory. This is the problem faced daily by the average consumer. The biggest disappointment among users of "wash-and-wear" merchandise is that the fabrics do not seem to meet the claims made for them. Yet, no buyer or retailer to whom I have talked receives complaints or returns for this reason.

*Presented October 8, 1959 at the 38th AATCC Convention, held in Washington, DC

Months ago, the average consumer was lured into making a purchase by the glowing claims for miracle-making easy care. As a promotional gimmick, it appears that the magic has worn off the phrase, "wash-and-wear". People are taking it for granted. Practically everything on the garment rack has a tag or label that signifies the garment has some type of "wash-and-wear" property. These claims range from "Easy Care" through "Minimum Care", "Drip Dry", "Wash and Hang to Dry", "Wash and Wear" and "Automatic Wash and Wear." Could it be that these names have become so common on the hang tag, that the consumer's eye slides over them without really seeing and understanding them? Or could it be that she understands and realizes that she needs to give these items a certain amount of care, no matter what the claim is? There is a demand for good "wash-and-wear." The woman who has a dress that lives up to the claims on the hang tag is thrilled to death with it and more than willing to pass along the news to her friends. The consumer is hoping she will find a garment that performs as indicated on the hang tag.

Individual comments made by consumers most often regard the "Drip-Dry" and "Need No Ironing" claims. Some of the following are representative of what consumers have said:

" 'Drip Dry' is such a nuisance that I rarely bother with it."

"I followed laundering instructions carefully, but the garment still appears wrinkled."

" 'Wash-and-Wear' requires separate treatment. I prefer materials that I can wash together and that look really smooth when ironed."

"I find labels misleading, for even though the garments don't require dampening, they need more than a little ironing."

This latter comment is one often voiced by consumers. Another example of the customer's opinion on labeling is this excerpt from a letter:

"I am continually frustrated by the labeling, that is, incompleteness of washing instructions, in articles of clothing that must be washed and which are supposed to be either 'wash-and-wear, no iron' or, according to the fabric content, have enough of the new synthetics that the article might be treated as such, but with no real assurance that one can. As a working mother with not much time to spend at ironing, I reject a good many items because of the indefiniteness of washing instructions. I would dearly love to have everything I buy be 'machine wash and tumble dryable.' Surprisingly enough, many articles of clothing not so labeled do come under that classification. But it takes courage to experiment. So I wish manufacturers would tell me, specifically, what I can or cannot expect of my purchases. And please eliminate 'little or no ironing'. Either a garment must be ironed or does not need it at all; there is no such thing as a little ironing if you have to set up an ironing board and pass an iron over a blouse or shirt. 'Easy to Iron' does not repel me. It sounds honest."

Hang tags are superficial. They are detached when the garment is worn. If the consumer keeps the tag, she must identify it so that she can refer to it when she launders the garment. Where is she going to keep this group of hang tags she has collected? Some friends tell me they keep them, but they never seem to be where they will be of the most use at the right time. Can sewn-in labels be used so that the consumer does not need to keep a filing system?

We could add more comments regarding the drip-dry qualities, but the left side of this dress is a good example of what the consumer is up against. Besides the appearance of the garment, the consumer usually has limited facilities for drying a complete wardrobe in the home. Many of you may recognize this short poem that I used in a similar situation a year ago, but it is apropos and I think bears repeating:

MODERN HOUSE

No matter how many rooms it has
To cook, or eat or lie in
It ought to have at least two baths
For drip-dries to drip dry in.

Early in the year I read in a Sunday issue of the *New York Times* that a home builder was doing something about this problem. To quote—

"To save housewives the inconvenience of hauling drip-dry clothes from the sink or washing machine to the basement or bathroom for drying, the builder of a ranch house in Connecticut has installed a drip-dry closet.

"The closet, located in the laundry room, is 2½ feet wide and 2 feet deep. The plaster walls are treated with a water-resistant compound. The closet has a copper pan floor, a 2-inch center drain and a chrome clothes pole. Ventilation is provided by a louvered door."

How many of us can afford such a closet? And, too, is this closet of sufficient space in which to drip dry a wardrobe for a family of four? The size of this closet is less than that of the average card table.

Even though she may have the space to hang clothes to drip dry, the average consumer does not like to puddle things out by hand. With all the advances made in home laundry equipment, shouldn't the homemaker be able to use her washer and dryer to turn out all her laundry?

How many of you know what plus features the washer and dryer have for "wash-and-wear" merchandise? Have the textile people, by using elaborate instructions and often false claims, made it easier or more difficult for Mrs Homemaker to do her laundry? The home-laundry-equipment industry gives her machines that do everything but talk, while the textile industry tells her to launder her garments by hand with care. Can you blame her for being confused?

Nor does the consumer like to do small loads of just "wash-and-wear" garments in her washer. She wants to be able to make up a full load of wash whether it be "wash-and-wear" or conventional cottons or a combination of both. Because she has not had enough garments for a full load, she has included the "wash-and-wear" with the regular garments even though the hang tags have given different instructions.

Too, the consumer may not have the type of equipment suggested on the hang tag. Therefore, many items may not receive the proper treatment. When a customer buys a "wash-and-wear" garment she thinks of how she is going to care for it, keeping in mind her facilities, not those used by the laboratory when the fabric was tested.

Manufacturers are advertising more garments as being the "Automatic Wash and Wear" type. This indicates that they are satisfactory if washed by machine and tumbled dry. How many consumers have tumble dryers? If the garments are satisfactory only if tumbled dry, isn't the sale limited?

Statistics found in the January, 1959 issue of *Electrical Merchandising* indicate that only 15.6% of the wired homes in the United States had dryers in 1958. However, 90.9% had washers. This means that, although the garments stand a good chance of being washed automatically, the great majority must be dried by other means. Does your hang tag give the customer an alternate method?

The average consumer may have a conventional washer and nothing but a clothes line on which to dry her laundry. She can't follow the hang

tag which says "Toss in your automatic washer and dryer." She should be provided with "wash-and-wear" merchandise that can be washed and dried satisfactorily by any method.

CHLORINE AND SOIL RETENTION———In the normal family group, one or more members may wear a white or light-colored garment for work or play. In the present "Do it Yourself Age", mother may find father's best white shirt covered with grease and the children's clothes with spots and stains. Being the average homemaker, she knows only one way to handle this problem—the use of bleach and usually a chlorine bleach. She doesn't keep any other in the house for one of more of the following reasons: 1) she may not know of any other kind, 2) friends have told her the other bleaches are not effective, and 3) she doesn't like to have so many supplies to store.

It is difficult for the customer to separate the "Don't Bleach" items from the ones that can be bleached. If any indication is given as to this property, it is on a hang tag which has already been disposed of. Therefore, all garments might be bleached and some may become yellow as a result.

During a conversation with a laundry consultant recently, we inquired as to whether laundries still had problems with yellowing of white garments. His comment was that laundries were not having as many problems with men's shirts for two reasons. First, if they know a garment is "wash-and-wear," they use hydrogen peroxide bleach on it. Secondly, if a garment has been bleached and yellows, it is treated to reduce yellowing. He also added that many laundries are using fluorescent dyes in the sour bath to whiten the white load. There are some problems with uniforms and women's blouses, however.

Some retailers have had uniforms and white blouses returned because of yellowing. We have talked to some retailers who say that the majority of their lines are nonchlorine-retentive fabrics, but an occasional one that is not creeps in. In most cases, not even the retailer can tell the difference. The fabric has the same construction, appearance and hand as one which does not retain chlorine. The difference shows up after it is worn and washed by the customer. It appears, then, that some mills still are applying those finishes that retain chlorine, even though improvements have been made along this line.

What happens if the garment manufacturer receives yardage of both nonchlorine and chlorine-retentive fabric? A garment we had recently is a good example. No difference was evident until after laundering. It is our practice to launder all white resin-treated cottons in the washing machine using the recommended amount of bleach in the wash water. After the first laundering, the blouse front, both sleeves and undercollar were white while the blouse back, top collar and cuffs were a pale yellow. Can you imagine the amazed look on the face of Mrs Homemaker if she had received this garment and taken it out of her washer?

The other day a gentleman approached me to ask what he should do about a shirt he had purchased recently. He said his wife had laundered it as she usually did his white shirts, but this one became gray and yellowish rather than a good white. It is evident that this shirt had picked up soil during the laundering process as well as possibly retaining some chlorine.

Consumers feel that soil retention is a problem with "wash-and-wear" merchandise. Stains are more evident on collars and across the shoulders of dresses or blouses. It is more difficult to remove stains from "wash-and-wear" merchandise than from conventional cottons.

Letters from consumers have said, "It is difficult to remove grease stains" and "Ground in dirt and really dirty dirt cannot be removed."

ODOR———There have been few complaints recently due to odor found in resin-treated fabrics. This has been due primarily to a change in type of resin being used. That does not mean there still is not considerable yardage around that has either the "fishy" or formaldehyde odor familiar to many of us. A few weeks ago I visited a dry goods store in a small town and was overwhelmed by the formaldehyde odor in the piece-goods department. It appears that some finishers need to be shown the finer points of "wash-and-wear."

WEARING QUALITIES AND DURABILITY———Among the reasons given by consumers for returning merchandise is that of low strength and poor abrasion resistance. The application of the "wash-and-wear" finish makes the fabric weaker and more harsh. When shirts or dresses show wear at collars, pockets and cuffs, customers will return them. Some retailers mentioned that the few returns they have are those where shirts show rapid wear at the collar points and cuffs. Customers are not satisfied when their garments tear or wear out quickly.

Durability of the resin finish is a varying factor. For how many launderings should the finish be satisfactory? Some finishes claim durability for the life of the fabric. One consumer said, "Many garments marked drip dry are really not. Resins wash out after several washings and the fabric is no longer drip dry." The garment may be very satisfactory for the first few launderings. After that it has the appearance of a conventional cotton. But the consumer cannot predict the durability of the finish on the garment she chooses nor is any information beyond the word "durable" given on a hang tag. And how durable is durable?

FABRICATION ——— While the question of fabrication may not be the concern of this group, the consumer's opinion may be biased by poor performance due to poor garment construction. She is not familiar to the point that she can distinguish between faults due to the "wash-and-wear" finish and those due to fabrication, and what's more, she shouldn't have to be. Usually the hang tag that accompanies the garment carries the name of the finisher or mill rather than that of the garment manufacturer. Therefore, I feel fabrication should be of some interest to this group.

Several individuals have said that they have been dissatisfied with the appearance of garments after laundering. This is due to the puckering of stitching at seams and other decorative areas. One woman mentioned that she returned a brand-name man's shirt because she could not press the seams smooth. The collar and pockets also had a very poor appearance.

Men have been pleased with the light-weight "wash-and-wear" suits, but several have mentioned that the seams were very puckered after laundering.

One consumer complained that a shirt he had purchased a few months ago had fallen apart at the seams after 15 hand launderings. It appears that the sewing thread was the problem. There are several choices of thread available to the garment manufacturer.

Sewing thread and seams are only one part of this fabrication problem. Interlinings and interfacings that shrink more than the outer fabric or

do not have "wash-and-wear" qualities result in a garment of poor appearance. Styling is also an important feature in the use of a "wash-and-wear" fabric. These two garments illustrate this point. The darker beige garment shows rather poor styling and stitching methods. The other pair of shorts is made of the same basic fabric but both stitching and seams have been kept to a minimum, which has resulted in a better-looking garment. In both cases, the fabrics had either a 4 or 5 rating after laundering. The garments have been washed at least seven times.

GOOD FEATURES AND IMPROVEMENTS——Although these comments and complaints may leave you with an impression that Mrs Customer is not pleased with "wash-and-wear" merchandise, there are many features about it that she likes immensely. All is not as black as the picture is painted. There is hope for success.

First of all, she wants *good* "wash-and-wear." She wants to buy it, wear it, wash it and wear it again without a lot of work between the "wash it and wear it." She doesn't want to iron her garments, but she wants to look as though she had.

"Wash-and-wear" has real value and the consumer is prepared to take advantage of it. Most fabrics need less ironing than do the untreated ones. Those that do need some ironing press out more smoothly with less effort than do the untreated fabrics.

What has been done to improve "wash-and-wear?" All factions in this big industry of ours have tried. They recognized many of these problems a long time ago and have put the best engineering brains to work to solve them.

Among the improvements are those being made by the spinners and weavers. They have developed, and are continuing to develop, new constructions so that the fabrics can withstand the effect of the resin application. Advances are being made in blending practices, too.

The chemical manufacturer has developed new resins to decrease the chlorine-retention problem. New products and new processes are available for preventing odor. There are fewer complaints of this type than a year ago.

Finishers are learning how to apply the new resins more efficiently and to turn out a consistently good product.

Even the garment manufacturer has done his part here. He has worked with thread and sewing machine people to develop the best stitching techniques and even new attachments for his machines. He has considered styling of the garment when using a "wash-and-wear" fabric. He has asked for slide-fastener tapes showing little shrinkage, for interlining and other findings that are used to be of the same quality as the basic fabric.

Added to this group are the many retailers who have worked to improve the quality of "wash-and-wear." My own company has done its part too.

We have developed standards for our trade name, "Perma Smooth." We feel that, to our customer, this name means better-quality "wash-and-wear." The standards for use of this trade name on any merchandise include many features.

First of all, for outer apparel, the fabric shall have an appearance rating of 4 to 5 after six washings and dryings. For the complete garment, the seams, creases or pleats shall have a 4 to 5 rating also. Linings and trimmings shall have a comparable appearance and the garment construction shall be satisfactory with no evidence of seam slippage or uneven shrinkage of the components.

The fabric is tested for wrinkle resistance and tearing strength on the original, and after six washings, for shrinkage and colorfastness to washing and light.

In addition, any white fabric is evaluated for damage due to chlorine retention and discoloration or soil pickup in laundering. Any garment that carries the "Perma Smooth" trade name must pass all these tests with flying colors. These standards are of assistance to our buying departments in evaluating "wash-and wear" merchandise as well as to assure our customer that she receives a better quality "wash-and-wear" item.

SUMMARY

To summarize Mrs Customer's reaction to "wash-and-wear", we can say that she definitely is sold on the idea, but she wants good quality "wash-and-wear." She wants fabrics that are tentered and finished correctly. She wishes that the advertising claims were more realistic because she knows that most garments need some pressing for a satisfactory appearance. She wants to be able to launder everything in her washer and dry it by any method that she chooses. She wants resin-treated white cottons that do not retain soil or chlorine. She wants fabrics with a durable finish and adequate wearing qualities. She wants well-styled and well-constructed garments. And with the continued cooperation of all factions of the textile industry, this dream of "wash-and-wear" should come true and live to a ripe old age.

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTEES
May 12-13 (Hotel Sheraton-Atlantic, New York, NY); May 12—Council Committees and Research Committees; May 13 (AM)—ECR, TCR; May 13 (PM)—Council

NATIONAL CONVENTIONS
Oct 6-8, 1960 (Sheraton Hotel, Philadelphia, Pa); Sept 28-30, 1961 (Buffalo, NY); 1962 (Southern Region)

DELAWARE VALLEY SECTION
Mar 4 (Beck's-on-the-Boulevard, Philadelphia, Pa); Apr 22 (Ladies Night, Northeast Shrine, Rockledge, Pa); May 20 (Outing, North Hills CC, North Hills, Pa); Sept 16 (Reading, Pa); Nov 4, Dec 9 (Philadelphia, Pa)

HUDSON-MOHAWK SECTION
Mar 27 (Chelsea House, Tribes Hill, NY); May 20 (Ladies Night); June 24 (Annual Outing)

METROPOLITAN SECTION
Feb 19 (Hotel New Yorker, New York, NY); Mar 18, Apr 22 (Kohler's Swiss Chalet, Rochelle Park, NJ); May 20 (Ladies Night—Swiss Chalet); June, 1960 (Outing)

MID-WEST SECTION
Feb 6 (Bismarck Hotel, Chicago, Ill; June 18 (Outing, Cerami's Island View Resort on Browns Lake, Burlington, Wis)

PACIFIC SOUTHWEST SECTION
Feb 5, Mar 18, May 13 (meetings); July 16 (picnic); Sept 24-25 (outing); Nov 18 (meeting); Dec 10 (dance)

PIEDMONT SECTION
Apr 2-3 (Hotel Robert E Lee, Winston-salem, NC); June 3-4 (Outing—Ocean Forest Hotel, Myrtle Beach, SC); Sept 23-24 (Hotel Charlotte, Charlotte, NC)

RHODE ISLAND SECTION
Jan 29 (Johnson's Hummocks); Mar 25 (Providence Engineering Soc); Apr 29 (Student Night); June 24 (Outing—Metacomet Country Club); Sept 23 (Management Night); Oct 28 (Providence Engineering Society); Dec 2 (Annual Meeting—Johnson's Hummocks)

SOUTH CENTRAL SECTION
Feb 7 (Hotel Patten, Chattanooga, Tenn); May 13-14 (Outing—Riverside Hotel, Gatlinburg, Tenn); Sept 10, Dec 9 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION
Feb 13, Apr 16 (Ida Cason Callaway Gardens, Pine Mountain, Ga); June 10-12 (Outing—Radium Springs Lodge, Radium Springs, Ga); Sept 10, Dec 3 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION
Mar 14 (Rapp's Restaurant, Shelton, Conn); Apr 8 (Hartford, Conn, area); May 6 (Ladies Night, Rapp's Paradise Inn, Ansonia, Conn); June 10 (Outing, Wallingford Country Club—tentative); Sept 23 (Blake's Restaurant, Springfield, Mass); Oct 21 (Annual Meeting, Rapp's Restaurant, Shelton, Conn); Dec 2 (Rapp's Restaurant, Shelton, Conn)

Minutes———

200th Meeting
TECHNICAL COMMITTEE ON RESEARCH

THE 200th meeting of the Technical Committee on Research was convened at 9 am on Friday, November 20, 1959 in the East Room of the Sheraton-Atlantic Hotel, New York, NY, with the chairman presiding. The following were present:

MEMBERS

C A Sylvester, *chairman, TCR*
C W Dorn, *chairman, ECR*
W D Appel
M J Babey
C A Baker
R F Caroselli
V L Chase
E M Eddington
W E Fayssoux
F Fortess
P J Fynn
N F Getchell
H B Goldstein
R T Graham
H E Hager
T H Hart
W A Holst
A E Johnson
E R Kaswell
S J Kennedy
G O Linberg
G J Mandikos
G P Paine
W G Parks
F A Prisley
G M Richardson
R E Rupp
B A Ryberg
R B Smith
J M Straley
J G Stass
R L Stutz
P J Wood
C L Zimmerman

Others Present

E Artim
G J Greendonner Jr (for C H A Schmitt)
R N Ingram
G M Kidder
W Klass
T R Koffman
E Morrill
H G Smith
H W Stiegler
G R Thompson

After calling the meeting to order, Chairman Sylvester asked for approval of the minutes of the 199th TCR meeting as published. A motion to this effect was made and seconded. The motion was adopted. The chairman extended an invitation received from the Metropolitan Section, which was holding a meeting that evening. Chairman Sylvester continued with the following remarks:

"Gentlemen, this is the 200th meet- of the Technical Committee on Research.

"A Research Committee consisting of eleven councilors and four appointed members was formed at the first meeting of the Council, held 38 years ago (November 18, 1921). It was voted at that time that the Research Committee would have supervision over all research work done by the Association and would also have the authority to delegate and distribute work to members of the Association and to outside agencies when desirable. The Technical Committee on Research held its first meeting in Boston, December 9, 1921.

"Today, approximately 140 members make up TCR and include councilors representing local sections, chairmen of research committees, and appointed members. There is also an Executive Committee on Research responsible for planning general research policy. Currently, there are 40 active research committees and 30 reference committees with a total membership approaching 450; each member an expert in a particular field.

"TCR has been extremely active since its inception and is nearing publication of its 100th test method in the *Technical Manual*".

REPORT OF DIRECTOR OF RESEARCH———H W Stiegler commented as follows:

"The AATCC Staff has been working on the development of an edgewear test for abrasion to simulate the effects of natural wear on cuffs, collars and seams. Further work is continuing on the Chlorine Retention Project on the following phases: effects of conditioning, scorching temperature, pressure of plates in 'scorch oven', etc, in accordance with the project as outlined by the Committee on Damage Caused by Retained Chlorine. Three additional fabrics have been produced by the Committee to permit study of resin-treated fabrics at low and medium levels of susceptibility to chlorine retention. In cooperation with the Committee on Colorfastness to Washing, the AATCC Staff developed a mechanical test using the Launder-Ometer to simulate the effects of five average hand launderings. This test will be circulated to TCR for letter ballot."

Dr Stiegler reported receipt of a letter from International Jantzen, Inc pointing out certain inadequacies of AATCC Test 63-1957, Colorfastness to Water, specifically that portion regarding chlorinated swimming pool water. Mr Sylvester suggested that this letter be referred to M J Babey, chairman of the Reference Committee on Colorfastness to Water for review and reactivation of the Committee.

COMMITTEE ON EVALUATION OF FINISHES FOR RESISTANCE TO STAINING AND SOILING (RA-56)———H B Goldstein, chairman, reported as follows:

"The Committee on Evaluation of Finishes for Resistance to Staining and Soiling held a meeting, which followed meetings of the Task Groups on Oil-Borne Stains and Wet Soiling.

"Hugh G Bryce resigned as chairman of the Task Group on Oil-Borne Stains, and E J Grajeck was appointed chairman to replace him.

"The Task Group on Oil-Borne Stains reviewed the data accumulated in the last series of interlaboratory tests. The results indicated fair correlation between the oil-heptane rating test procedure and actual soiling procedures; however, there appeared to be poor correlation between the oil-heptane rating and the oil-wicking test.

"The Task Group on Oil-Borne Stains will attempt to more closely simulate the effects of the actual soiling which occurs in fabric usage, and with the results thus obtained, the group will set up more reliable criteria for the evaluation of possible laboratory test methods for evaluating resistance to oil-borne stains.

"The Task Group on Wet Soiling, under the chairmanship of Charles L Zimmerman, has conducted several series of interlaboratory tests to determine the wet-soiling characteristics of resin-treated fabrics. On the basis of these initial tests, the problem of wet soiling appears less severe than originally anticipated. However, the range of finishes tested was not sufficiently broad to permit us to draw a definite conclusion.

"Further work of the Wet Soiling Task Group will include repeat tests on some of the previous series, and will also include additional finishes to enlarge the scope of our testing.

"A representative of the ASTM Committee on Soil Redeposition was present at the meeting, and it was agreed that benefit would result through the cooperation of the AATCC and ASTM Committees on this work."

COMMITTEE ON DRYCLEANING TEST METHODS (RA43)——— Chairman R T Graham reported as follows:

"At the previous Committee meeting in September, it was generally agreed by those present that the temperature for the laboratory test to evaluate colorfastness could be raised to 140°F in order to provide a more realistic test and a better correlation with commercial drycleaning. A letter ballot was sent out to

the Committee incorporating this increase in running temperature.

"This letter ballot had the beneficial effect of stirring up more interest in this project and at yesterday's meeting some evidence and data were presented to the group to show that, on certain fibers with certain dyes, the 140°F temperature may unduly penalize some colors with respect to drycleaning fastness. It has been agreed that a task group should be set up to consider a lower temperature range (around 115°F). This group should also obtain as large a selection of known fibers and classes of dyes as is possible.

"The ultimate objective of this committee on this project remains the same, namely, a laboratory test method which will be severe enough to detect most colors that react poorly to drycleaning and yet not reject those colors which are commercially drycleanable."

COMMITTEE ON BLEACHING (RA34)———G R Thompson, Staff Liaison for the Committee on Bleaching, read the following report prepared by the Committee secretary, A F Chadwick:

"W A Holst reported that the peroxide bleaching procedure in the test for colorfastness of dyed wool damaged the wool. It was agreed that steps would be taken to get the procedure revised.

"The proposed procedure for measuring alkalinity with 0.1N acid is being submitted to the Research Committee for approval. A copy is attached.

"R P S Black reported on the meeting of the Absorbency Committee which he had attended.

"A procedure has been drawn up for determining noncotton content of bleached cotton fabric. After minor revisions have been made, this will be submitted to the Technical Committee on Research.

" L Smith of Columbia Southern reported on a new method for determining reflectance. The fabric is ground before measuring. He will write a report on his work."

A motion was made and seconded that the proposed test methods on determining alkalinity in bleach baths and noncotton content of bleached cotton fabric be circulated by letter ballot to TCR. The motion was adopted.

COMMITTEE ON END-USE PERFORMANCE OF TEXTILES (RAS-44)———Chariman A E Johnson made the following report:

"Because of changes that have taken place in the activities of this Committee since its organization several years ago, it was voted to recommend a change in its name to 'Committee on End-Use Performance of Textiles.' Its former title was 'Committee on End-Usage Performance Tests.' It was also voted to recommend the adoption of the following statement of the scope of this Committee:

'This Committee is concerned with trends in textile behavior problems in end-use, serving as a liaison with other committees in providing information which may be useful in the development or refinement of test methods. One of its principal concerns is the operation of an Interlaboratory Statistical Plan for gathering data from various laboratories on consumer complaints about textiles.'

"The Committee reviewed a six-month report of its Interlaboratory Statistical Plan for the period ending June 30, 1959. It is agreed that the data are very difficult to interpret and that in some respects the information is of little use in its present form. It is felt, however, that the Plan should be continued for the balance of the year at which time a reappraisal of its form and content will be made. The Committee fully accepts that the development of a system of data collection on textile performance is very much needed and that the first year's experience will help determine what changes should be made to assure that the Plan will serve AATCC and industry interests as intended."

A motion was made and seconded that the name of Committee RAS44 be changed to "End-Use Performance of Textiles." The motion was adopted.

COMMITTEE ON COLORFASTNESS TO LIGHT (RA50)———V L Chase reported for Chairman J E Norton as follows:

" V S Salvin's subcommittee reported that investigation of the effect of atmospheric contaminants on lightfastness is at the stage where the sealed chamber for a Fade-Ometer must be completed before definitive results can be obtained. It is hoped that rapid progress will be made on this device.

"Subcommittee II reported that the first group of outdoor exposures has been completed to the point of rating. Interlaboratory tests in different machines will be started very soon.

"The Committee considered the status of the Blue Wool Standards. Survey of the yardage on hand showed that, even though the new standards were received only three years ago, L-6, L-7 and L-8 are almost depleted. Since these standards were expected to last more than five years, the Committee recommends additional yardage of the various standards to bring each to an estimated five-year supply at present rates of usage. The Committee voted to ask for $10,000 to finance this work."

A motion was made and seconded that an appropriation of $10,000 be requested for replenishment of the supply of Blue Lightfastness Standards. The motion was adopted.

COMMITTEE ON WASH AND WEAR (RA61)———G M Richardson, chairman, presented the following report:

"Programs are being actively pursued in two areas, namely:

1) Modified lighting methods with garment evaluation as an ultimate goal.
2) Methods for evaluating the appearance of creases, seams and pleats.

These will be discussed separately below, covering first the program dealing with lighting methods.

"The present test employs low-angle lighting and requires a dark room, which is not always available. It has been the desire of the Committee to develop a viewing procedure utilizing diffused overhead lighting more closely approximating normal room lighting. At the same time, in keeping with the Committee's long-range objectives, it is believed that such a method will better lend itself to garment evaluation.

"To this end, an interlaboratory test has been designed to develop data on an alternate lighting method adaptable to both fabric and garment evaluation. The test will include photographs and three-dimensional replicas utilizing overhead diffused lighting versus low-angle lighting. A statistically designed plan has been developed for the test and data sheets have been prepared, which are designed to fit the plan. Procedural instructions are being prepared and the test will be initiated in December 1959. The first test will be made on fabric swatches. However, consideration may later be given to testing garments.

"Ten fabrics have been selected for inclusion in the test. These represent

a spread in: fabric performance, weight, fiber type, color pattern and print as well as construction. Specification for lighting, mounting samples and viewing have been agreed upon by our committee.

"Changing our subject now to that of evaluating the appearance of creases, seams and pleats, the first attempt to set up a comparative rating scale for these will be made using photographs. This decision was reached after some unsuccessful attempt to develop plastic replicas.

"It was the consensus of the Committee that a definition of performance levels could best be reached through photographs. Once these are developed, consideration will then again be given to the advisability of exploring the use of replicas.

"Since the last Committee meeting, announcements have been made of two different objective viewing procedures for measuring the smooth appearance of fabrics. These are: the Cluett-Peabody 'Sanforized-Plus' program and the DuPont 'LAP' (Low-Angle Projection) method. In view of these, it was decided that the Wash and Wear Committee should study these and other methods and relate their utility to our method. Accordingly, a subcommittee was formed to investigate all other methods and report on them with recommendations for action at the January meeting.

"Consideration is being given to undertaking a test program aimed at developing a method for simulating wear wrinkling and mussing. It will be possible to consider effort in this area as soon as some of the laboratory and manpower now being devoted to the evaluation of appearance after laundering becomes available.

"An editorial committee headed by Charles R Williams has edited the 'wash-and-wear' testing procedure so as to include some approved revisions. This revised procedure will be submitted for approval so it may be incorporated in the *Technical Manual.*

"Favorable comments were received from the members regarding the Committee's meeting arrangements whereby all of the subcommittees hold their meetings immediately preceding the main Committee meeting. Since this has worked out so favorably, other committees may wish to consider it."

COMMITTEE ON DIMENSIONAL CHANGES IN TEXTILE FABRICS (RA42)———Committee Secretary E Artim presented the following report:

"Draft Number 2 of Proposed Tentative Test Method 'Dimensional Changes in Woven or Knitted Textiles (Excluding Wool)' was submitted to Letter Ballot 5-59 of Committee RA42. After discussion and resolution of minor editoral changes during the meeting held on November 19, 1959, Letter Ballot 5-59 results were as follows:

Yes	*No*	*Not voting*	*Possible total*
9	0	0	11
11*	0	0	13*

Notes: *Two new people, who were not official members of the Committee as of November 19, 1959 but who have expressed desire to become members and have attended the last two meetings, voted approval.

Two members who are entitled to a vote but did not return a ballot have voted approval of Draft Number 1 of the proposed test method. This information is given to signify unanimous approval of Committee RA42.

"Ralph Smith moved (seconded by Genevieve Smith and passed with unanimous vote) that Committee RA42 submit Draft Number 2 with editorial changes to TCR for circulation to letter ballot. This proposed tentative test method would replace tentative test methods 91-1958 and 95-1959 of the *1959 Technical Manual.*

"This proposed tentative test method, 'Dimensional Changes in Woven or Knitted Textiles (Excluding Wool)' is a combination of existing AATCC test methods 91-1958 and 95-1959 with existing ASTM test methods for knitted fabrics. Draft Number 1 was submitted to information ballot 3-59 and circulated to AATCC RA42 and ASTM Task Group on Knit Fabrics (which developed all of the tests relating to knitted fabrics). Written confirmation by Hazel M Fletcher, chairman, Task Group on Knit Fabrics of Subcommittee B-1, Committee D-13, ASTM, of a unanimous approval for the knitted fabric sections contained the following concluding statement.

'I hope that AATCC will accept the proposed method as tentative. This will be real progress.'

No new interlaboratory tests were necessary since all the parts of the proposed tentative test method are presently published test methods.

"This test method determines the dimensional changes of woven or knitted fabrics, made of fibers other than wool, to be expected when the cloth is subjected to laundering procedures commonly used in the commercial laundry and the home. Four washing test procedures are established, varying in severity from very severe to very mild, and intended to cover the range of practical washing from commercial procedure to hand washing. Five drying-test procedures are established to cover the range of drying techniques used in the home and commercial laundry. Three methods for determining the dimensional restorability characteristics are established for those textiles which require restoration by ironing or wearing after laundering. These tests are not accelerated and must be repeated to evaluate dimensional changes after repeated launderings.

"Table I summarizes all of the various washing, drying, and restoration procedures available. The person using these tests must determine which combination of procedures is practical for any specific item in order to evaluate the dimensional changes of textile fabrics or garments after laundering procedures used commonly in the home or commercial laundry. It is possible to identify the test procedure completely with a three-digit number consisting of a Roman numeral, letter, and Arabic number. For example Test III E 1 refers to a specimen which has been washed by procedure III (at 160°F for total of 60 minutes in machine), has been dried in a tumble dryer by procedure 'E', and has been subjected to restorative forces on the tension presser by procedure "1".

"Committee RA42 is making necessary revisions and is combining AATCC Tentative Test Methods 73-1953 (Shrinkage of Wool Hose: Accelerated Test), 74-1953 (Relaxation and Felting Shrinkage of Wool Textiles: Accelerated Test) and 41-1952 (Dimensional Changes in Wool Textiles: Accelerated Test) into one test method.

"Ralph B Smith, chairman of a nominating committee appointed by John F Warner, presented Edward Artim's name as chairman to succeed Mr Warner. Earl Dunlap moved (seconded by Harry C Donaldson Jr) that the nominating committee's recommendation be accepted. The motion was carried by voice vote. The

TABLE I

Washing procedure Temp & total time	*Drying procedure*	*Restoration procedure*
I. 100-109°F for 30 min	A. Drip dry	1. Tension pressure
II. 120-129°F for 45 min	B. Flat-bed-press dry	2. Knit shrinkage gauge
III. 160-169°F for 60 min	C. Screen dry	3. Hand iron
IV. 203-212°F for 60 min	D. Line dry	
	E. Tumble dry	

nominating committee will present a recommendation for a new secretary to succeed Mr Artim at the next meeting."

A motion was made and seconded that the proposed test method "Dimensional Changes in Woven or Knitted Textiles (Excluding Wool)" be circulated to TCR for letter ballot. The motion was adopted.

COMMITTEE ON COLORFASTNESS TO PERSPIRATION (RA52) ———TCR Secretary G J Mandikos read the following report submitted by C H A Schmitt, chairman of Committee RA52:

"In the report at the September 11, 1959 Meeting of TCR, we reported on the objective as well as the work done to date. Since the Committee was only organized at the first of the summer, we have had only two meetings, but in between, considerable work has been done and a great deal accomplished.

"The new inexpensive perspiration tester passed initial tests in every way. One of these units was on exhibition during the convention in Washington. A number of units will be in the hands of Committee members during the next few weeks for final interlaboratory testing.

"As reported at the last meeting, the new apparatus is very simple. The concern which has agreed to make it has set $25.00 as a top price per unit or $50.00 for the two units which will be recommended, one for the acid, the other for the alkaline. However, we are presently checking the patent situation and while, in our opinion, the new model does not infringe on the older one, we do want to be clear on the matter before proceeding any further. The basic idea of a rack system was developed within the Perspiration Committee and the only difference between the existing model and our original idea is in the method of applying pressure. In our new model we have eliminated this point.

"The second important phase of our program concerns a study of the various methods proposed by different Continental groups for adoption by ISO. Much of the dyed material needed for this test program is now ready for distribution to members to carry out this work. We expect to complete this work in order to present a definite report at the 1960 meeting of the ISO".

COMMITTEE ON FLAMMABILITY OF CLOTHING TEXTILES (RA47)———The following report by Committee RA47 was submitted by Chairman C A Baker:

"The meeting of the Flammability Committee was called for the express purpose of reviewing the record of the Committee's action in connection with the National Fire Protection Association's tentative test method No. 702T. The NFPA method was adopted in Atlantic City in June, 1959.

"Sidney M Cone Jr brought to the attention of Past Chairman R C Geering the serious effect the method could have on the textile industry if it was given an official status by legislative action.

"The Committe's work with NFPA dates back to the formation of the latter's technical committee. Members of the AATCC group have served continuously. Recent action on the part of ECR, with which our group concurred, caused the removal of official AATCC representation on the NFPA committee because the 702 method was adopted over our objections.

"We reviewed the exchange of correspondence leading to our withdrawal. This correspondence was between ECR and NFPA. There was also a letter in the record to M Lonie of the Dept of Commerce from Charles W Dorn giving an excellent status report on the AATCC method with a strong recommendation to continue its use in the Federal Act. This letter resulted from an inquiry by Mr Lonie on the comparison of the AATCC method to the NFPA method.

"As the matter now stands, our Committee has withdrawn from the NFPA flammability group and does not intend to lend weight or offer corrections to their method. We feel that our work at the technical level has been completed.

"Mr Cone agreed with this decision and stated that the matter is now one of industry policy.

"Nelson F Getchell brought to our attention two new developments in flammability testing. The English have adopted a standard of testing based on the use of a six-foot strip of fabric. A literature reference was given for those interested.

"Mr Getchell also opened the subject of the NBS radiant-heat-panel test, which has been used successfully in floor-covering investigations. Our committee will investigate the possible use in connecton with apparel textiles.

"Mr Cone and George Krumholz have been added to our membership."

NEW CHAIRMEN OF RESEARCH COMMITTEES——— Mr Sylvester stated that the following have been nominated to replace retiring chairmen:

William G Klein, Fabric Research Laboratories, Inc, chairman of the Statistical Advisory Committee (RA-S67).

Jack Turer, L Sonneborn Sons, Inc, chairman of the Committee on Static Electricity on Textiles (RA32).

Albert C Nuessle, Rohm & Haas Co, chairman of the Committee on Damage Caused by Retained Chlorine (RA35).

Edward Artim, J C Penney Co, chairman of the Committee on Dimensional Changes in Textile Fabrics (RA42).

V Lindsay Chase, Interchemical Corp, chairman of Committee on Colorfastness to Light (RA50).

Virgil D Lyon, E I DuPont de Nemours & Co, Inc, chairman of the Committee on Colorfastness to Washing (RA60).

NEW APPOINTMENTS TO RESEARCH COMMITTEES——— The following appointments have been approved:

Carl Horowitz, Yardney Chemix Corp, to Committee on Antibacterial Agents (RA31).

Fred B Shippee, Gagliardi Research Corp, to Committee on Antibacterial Agents (RA31).

Herbert J Leavitt, General Electric Co, to Committee on Water Resistance of Fabrics (RA63).

George E Mona, Sayles Finishing Plants, to Committee on Water Resistance of Fabrics (RA63).

Donald P Feyler, American Viscose Corp, to Committee on Colorfastness to Light (RA50).

Frederick A Prisley, Brookneal Mills, to Committee on Colorfastness to Perspiration (RA52).

Richard S Hunter, Hunter Associates Labs, to Committee on Color (RA36).

Arthur A Dunham, U S Testing Co, to Committee on Wash and Wear (RA61).

Franz Hausner, Spring City Knitting Co, to Committees on Bleaching (RA34) and Dimensional Changes in Textile Fabrics (RA42).

Russell V Zerbe, Snow White Bleachery, to Committees on Bleaching (RA34) and Dimensional Changes in Textile Fabrics (RA42).

Luther B Arnold Jr, Vikon Chemical Co, to Committee on Antibacterial Agents (RA31).

COMMITTEE ON DEFINITIONS (RAS39) ——— Because Committee RAS39 had been inactive for over a year, with no projects in the offing, it was recommended that this Committee be placed on reference status with J H Menkart as chairman.

A motion was made and seconded to this effect. The motion was adopted.

ADJOURNMENT———The meeting was adjourned at 10:40 am.

CORRECTION

YOUR attention is called to an error which appeared in the article "Identification of Unknown Synthetic Fibers" by Sidney G Smith, which appeared in the December 28, 1959 issue.

On page 25, second column, beginning with the paragraph "The Group 2 fibers . . . . .", the linotypist inadvertantly omitted the last half of one sentence, and the first half of another, which should have begun a separate paragraph. For the sake of clarity, these two paragraphs are correctly reproduced below, with the omitted words in italics.

"The Group 2 fibers Dacron and Vycron are immediately indentified because they are the only two among all considered in this paper that have a Becke Line that moves toward the fibers when examined parallel in 1-bromonaphthalene. They are distinguished *between themselves by their micro fusion points: Dacron 257-258°C, Vycron 238°C.*

"Among the Group 1 fibers, nylon 66 and 6 can be distinguished from Kodel by the fact that, when mounted in monochlorobenzene and examined perpendicular, Kodel's Becke Line moves toward the fiber, whereas nylon's line moves toward the liquid. Dacron's and Vycron's lines also would move toward the fiber, but they will be eliminated by their behavior in 1-bromonaphthalene."

* * *

Your attention is called also to error which appears on page 655 of the *1959 Technical Manual.*

Following the name of Rudolph Zwicky in the alphabetical listing of membership, it is stated that Mr Zwicky is president and manager of "Helman" Chemical Co. This should correctly read "Helam" Chemical Co. The address, namely Box 708, Sycamore, Ill, is correct as listed.

Membership Applications

DECEMBER 23—JANUARY 6

NEW ENGLAND REGION

Northern New England Section

Transfer to Senior

Harry A Freedman—Textile engr, Malden Mills, Lawrence, Mass. Sponsors: B Blagman, D Frishman.

Western New England Section

Senior

John D Hancock—Head finisher, Stafford Printers Inc, Stafford Springs, Conn. Sponsors: C E Pickard, L W Cleveland Jr.

Rhode Island Section

Senior

Richard J Mahoney—Sales rep, Alco Oil & Chem Co, Providence, RI. Sponsors: J P Seguin, R D Robinson.

Transfer to Senior

Howard J Baumeister—Head of screen printing, Cranston Print Works Co, Cranston, RI. Sponsors: R H Phillips, H F Kilguss.

CENTRAL ATLANTIC REGION

Metropolitan Section

Senior

James I Beam—Quality control, Woolen Div, Amerotron Co, New York, NY. Sponsors: W S Myers, J W Stallings.

Vincent J Zaretski—Textile colorist, Verona-Pharma Chem Corp, Verona Dyestuffs Div, Union, NJ. Sponsors: B R Celentano, E Channon.

Associate

George H Hansen—Vice pres, machinery dealer in dyeing & finishing, Industrial Products of America, Paterson, NJ.

Transfer to Junior

Mary L Silva—Chemist, research dept, American Cyanamid Co, Bound Brook, NJ. Sponsors: G R Thompson, G M Kidder.

Transfer to Senior

Keith R J Horner—Exec vice pres, Ciba Co Inc, Fair Lawn, NJ. Sponsors: P J Luck, C J Weidmann.

Delaware Valley Section

Associate

Martin F Monihan—Industrial rep, International Salt Co, Clarks Summit Pa.

SOUTHERN REGION

Washington Section

Senior

Arthur Mason DuPre Jr—Physical science administrator, U S Dept of Agriculture, Agriculture Research Service, Washington, DC. Sponsors: F H Forziati, J C Smith.

Piedmont Section

Transfer to Senior

Clyde B Anderson—Chemist, tech asst to supt, Dublin Finishing Co, Div of Burlington Industries, Dublin, Va. Sponsors: E W Teague, J E Greer.

Thomas M Griffin—Asst dir of quality control, Riegel Textile Corp, Ware Shoals, SC. Sponsors: D W Kern, J C Cavin.

Henry C Hagans—Foreman & shift dyer, Greenville Mills Inc, Greenville, NC. Sponsors: M H Hudson, D W Young Jr.

Alston Ramsay Jr—Chemical specialty sales, Ciba Co Inc, Charlotte, NC. Sponsors: A R Thompson, C O Stevenson.

Southeastern Section

Senior

Dennis E Shea—Vice president, Vanta Corp, Montezuma, Ga. Sponsors: R S Brooks, F X Nerney.

Associate

Charles H Adams—Sales rep, A E Staley Mfg Co, Decatur, Ill.

WESTERN REGION

Pacific Southwest Section

Senior

Myron A Herschler—Manager, Costa Mesa Knitting Mills Co, Costa Mesa, Calif. Sponsors: W E Kramer, P F Noonan.

UNCLASSIFIED

Senior

Ernest S Beton—Textile print works chemist, Brocklehurst-Whiston Amalgamated Ltd, Cheshire, England. Sponsors: G R Thompson, G M Kidder.

Henry Biberfeld—Chemist, A Hollander & Son Ltd, Montreal, Quebec, Canada. Sponsors: G R Thompson, G M Kidder.

Edgar Brunner—Manager, E Brunner & Co Ltd, Porto, Portugal. Sponsors: G J Mandikos, G M Kidder.

Kalevi Tassi Varis—Supt of dyeing, bleaching & finishing, Barker-Littoinen, O Y Cotton Mill, Turku, Finland. Sponsors: J V Moore, C H M Moring.

Student

Do Sun Bai—Student, Engineering College of Seoul National University, Seoul, Korea.

Southeastern

PHOTOS taken at the December 5, 1959 meeting of the Southeastern Section, held at the Atlanta Athletic Club, Atlanta, Ga, appear at the right. An earlier report on the meeting appeared on page 40 of the December 28, 1959 issue.

A

A—SOUTHEASTERN SECTION OFFICERS FOR 1960—L to r: A Kempton Haynes, custodian; Warren E Tiller, secretary; Robert B Hallowell, chairman; William B Amos, vice chairman. Leon Tigler, treasurer, was not present when photo was taken.

B

B—Leon Tigler, Reeves Bros, Inc, served as moderator of discussion on fabric preparation.

C

C—Robert A Brooks, E I duPont de Nemours & Co, Inc, who spoke on "Chemical Principles of Dyeing and Finishing".

●

Rhode Island

RHODE ISLAND SECTION will meet this Friday, January 29, at Lindy's Bali Room, Cranston, RI. Speaker of the evening will be Norman S Cassell of Interchemical Corp, who will discuss "New Horizons for Pigment Printing & Dyeing".

Future Papers

The following list is comprised of titles of papers submitted to date for publication in future issues of the Proceedings. Authors and Technical Program Chairmen are requested to examine this list and call our attention to any omissions.

"Fluorescent Brighteners and Bluing Agents in Wool Processing"—Delaware Valley Section

"New Developments in Evaluating 'Wash-and-Wear' Performance" — James R Bercaw, E I du Pont de Nemours & Co, Inc

"Man-made Cellulosic Fibers in 'Wash-and-Wear' "—A B Hilton, G V Lund, and A E Martin Jr, Courtaulds (Alabama) Ltd

"Retrospect and Prospect: Progress and Problems in 'Wash-and-Wear'—Preliminary Report" — Pauline B Mack, Marguerite C Barra, Attelia L Muller, and Elizabeth F Thomas, Texas Woman's Univ

"Recent Advances in the Technology of Dyeing Blends Containing Dacron Polyester Fiber"—Paul L Meunier, E I duPont de Nemours & Co, Inc

"Dyeing and Finishing Special Blends of Arnel with Acrylics and Arnel with Cotton in Circular Knit Application"—Ralph E Lacy and Jack A Dayvault, Celanese Fibers Co

"Recent Advances in the Pressure Beam Dyeing of Synthetic Fabrics" —Walter J Newcomb, Gaston County Dyeing Machine Co, and George C Ward, Celanese Fibers Co

"Twelve Million Yards of Natural and Man-made Fibers Dyed on the Swedish Pad-Roll Dyeing Machine" Robert M Lesh, Northern Dyeing Corp

"The Monforts Reactor—A New, Continuous Dyeing machine"—Joachim C Roehl, A Monforts Machine Works

"Dyeing Blends of Dacron Polyester Fiber and Cotton by the Du Pont Thermosol Process"—J J Iannarone and W J Wygand, E I duPont de Nemours & Co, Inc

"The I-T Process for Applying Cationic Dyes to Acrylic Fibers"—J A Leddy, Geigy Dyestuffs

"Chemical Principles of Dyeing and Finishing"—Robert A Brooks, E I duPont de Nemours & Co, Inc

"Production of Man-made Fibers" —S L Hayes Jr, E I duPont de Nemours & Co, Inc

"New Developments in Dyeing and Printing Polyester Fibers"—Dorel Marian, Compagnie Francaise des Matieres Colorantes

"Dyeing Dacron by Emulsions of Solvent Solutions of Dyes"—Robert J Peirent, James Casey and Georgia Dadoly, Lowell Technological Institute

"New Horizons for Pigment Printing"—Norman S Cassell, Interchemical Corp

"Finishing Blends of Orlon and Cotton in Underwear"—Herbert T Pratt, E I du Pont de Nemours & Co, Inc

"Orlon Cantrece—Du Pont's Newest Sweater Fiber"—Herbert T Pratt, E I duPont de Nemours & Co, Inc

"Laboratory Tested and Approved" —P J Fynn, J C Penney Co

JANUARY JEREMIAD
1960

Inter Alia—Inter Nos

P J WOOD

BENEVOLENT ACCESSORIES BOTH BEFORE AND AFTER THE FACT

Paul B Stam wrote us some time ago, noting our interest in books and libraries, soliciting our help in doing something to help the trustees of New York Library do a better job in serving those who read what they provide. Dr Stam is director of research at J P Stevens & Co Inc; the said trustees have asked him to serve on a committee of citizens to study the function of their Science and Technology Division in order to recommend improvements. If any of you have any suggestions that might be helpful, please write your ideas to Paul at PO Box A-2, Greensboro, NC.

Sydney M Cone wrote, saying how much he and his wife enjoyed their European trip and especially two weeks spent in the Greek Archipelago.

John H Karrh writes that dyeing the polypropylene fiber recently introduced by Reeves Brothers is being worked on by their research people and any day we may expect news on this. In the meantime, they are making great strides in developing outlets for the fiber in the undyed state.

Al Johnson wrote a letter on our article in a prior issue regarding drycleaning and fully convinced us that the British don't know as much about drycleaning as we do. Maybe they'll catch up with us some day, Al.

Julian S Jacobs, the retired editor of Textile Research Journal, is living in Athens, Georgia, which led us to remark to him that his choice of a place to live might give rise to the suspicion that he was preparing to join the staff of the University of Georgia. He replied that any such rumor can be categorically denied. He is enjoying his retirement and his job as secretary of the Fiber Society and is planning to make a three-month trip to Europe in the spring. Good luck to you, Julian; get one of those small European cars like Ralph Fischer did; he and his better half went over and covered several countries a couple of years ago; this year they spent the same time in one country, England, and visited innumerable cathedrals, with which England is plentifully blessed.

Quite some time ago we wrote a short dissertation on the early days of the dyestuff industry in this country, mentioning a visit we made to the factory of Willy Beckers in Carnarsie, of all places, mentioning several of the individuals we met on that trip, including Dr Willy Beckers himself. It seems we omitted several important names, as Charlie Stone, one of our earliest Charlotte, NC, friends, wrote us that he also belonged to that distinguished group and asked us about two other men who also worked there - Sydney R David and W T Miller. Charlie Schmitt of Sandoz told us he worked for Syd, but didn't know his address; however, he also told us that "Skip" McCool had also worked in David's Company and might know his present address. Skip gave us the address of S R David to whom we wrote suggesting he write Charlie Stone. If he did this, we do not know, but Charlie never told us, if he did. We have no news of W T Miller to this day.

FELISOL

This odd word, as reported in a previous number of this journal, is derived from the original French name Federation du Label Internationale de Solidite, the underlined letters being used to form it. The word is always used spelled with all capital letters, FELISOL. The organization is the Federation of the International Fastness Label.

K McLaren, the author of the article in JSDC, who is a member of the Dyehouse Department of ICI, had the kindness and politeness to send us a few copies of the item, which we sent to friends in the textile industry who will undoubtedly be interested. In the letter which came with the literature, Mr Mac brought us up to date on the membership in this growing organization. Here are the figures:

Country	User-members in May		in August	
Holland	57		63	
Italy	46		50	
Switzerland	33		33	
Austria	17		17	
Belgium	18		18	
Spain	9		9	
France	11		12	
United Kingdom	1		1	
Germany	2	193	2	205

Not a bad growth for that short space of time, three months.

The success of this idea will depend on the efficacy of the policing of the product. Setting up strict rules as to the standards required for performance of goods which will bear this label; then rigid adherence to those rules will generate in the purchasing public such confidence that the word FELISOL will assure to the consumer the integrity of the product.

Maybe the institution of some such labelling program, squarely administered, without fear or favor, is what is needed to produce in the mind of the customer that confidence in "wash-and-wear" that we would all like to see.

After all, integrity in both men and methods is the true goal.

CHARLESTONESE

It seems the Charleston News & Courier has issued a "Complete Dictionary of Charlestonese", which it is selling for what Elmer calls "two bits". The proceeds are devoted to augmenting the assets of the News & Courier's "Good Cheer Fund". We shall send for this soon.

A fair indication of what is to be expected in this publication we gleaned from a small table napkin some good friend mailed from Charlotte, NC, the other day. Here are some samples of the definitions: GROAN - Increasing in size; BONE - Blessed event, ie, "I was bone a Charlestonian" (a VERY blessed event, in the minds of all Charlestonians); ABODE - a wooden plank; WRETCHED - The long name for the nickname "Dick"; RUM - An enclosed space within a building; LACK - Enjoy, ie, "I lack fried chicken; et cetera, etc &c.

The paper napkin we mailed to George O'Linberg, whom we have never found lacking in a sense of humor.

LAZINESS

Lo, "The way of the slothful man is as an hedge of thorns" said Solomon, who just couldn't afford to be slothful as he had to go out and scrape up enough wherewithal to keep 200 wives, or was it 400? Or maybe he sent them out to earn enough to keep him in the way to which he was accustomed, in which case he was fully qualified to carry the badge of "the wisest man".

On looking up the savants, it is interesting to find that not all of them agree with old Sol as to the unprofitableness and wickedness of idleness. James Albery as an instance, for instance, evidently deplores it in himself, as witness his self-written epitaph:

"He slept beneath the moon,
He basked beneath the sun;
He lived a life of going-to-do,
He died with nothing done."

Coleridge, on the other hand, while not exactly condoning it, appears to tolerate it with the word, "The love of idleness is universal, or next to it".

George Farquhar rewrote that great saying of St Paul to make it "Idleness is the root of all evil".

Theophile Gautier (probably in an attempt at self justification), made this observation, "The occupation most becoming to a civilized man is to do nothing".

Even on this subject, which most folks would feel has only one side, there is an obvious lack of agreement, so what is one to think? As the Latins had it, "Quot homines, tot sententiae" - Many men, many minds.

YIP YEE CHLAM CHLEE

That unique publication "Quote", which has published quite a collection of startling restaurant signs, from time to time, came up with this gem the other day, in a Chinese restaurant: "Moo Goo Gai Pan - just like Mother used to make."----Q.E.F.

Abstracts

Effect of Structure on the Change in Color of Vat Dyes on Soaping

Wegmann, J (Presented at Congress of International Federation of Associations of Textile Chemists & Colorists, Sept 18, 1959; published by Soc of Dyers & Colourists)

After a general survey of the problem of the changes in color which accompany the soaping of vat dyes, it is shown that, at least for a limited range of dyes (the 1,4-dibenzamidoanthraquinones), such changes must be due to changes of a molecular character.

A change of color on developing a vat dyeing will always occur if the dye, after reoxidation, is first produced in a metastable form, which is stabilized by adsorption on the substrate, so that a certain activation energy is required to attain the most stable state of the dye under these conditions. If the differences in stability are great enough, it may be possible to obtain these forms in colloidal solution or even as crystalline modifications.

The stability of these forms may be quite different in a different environment, eg, in organic solvents. There are obvious parallels between these phenomena and the changes in color which can be observed with organic solutions and are termed "solvatochromism" and "thermochromism". Like these phenomena, the changes due to soaping cannot be ascribed to one single cause, and the different possibilities of molecular variations such as isomerism, polymerism, and mesomerism must all be taken into account.

According to the type of constitution, other causes may be operative, and it appears possible that, in the case of condensed ring systems, like dibenzanthrone and pyranthrone, it is more likely that different forms of stabilized equilibria of mesomers have to be considered rather than isomers proper. However, the lattter probably play the major part in the indigoid series, with dipyrazoleanthronylene, with dyes having amide groups, and therefore with the azoic dyes.

•

Printing on Wool and Silk with Cibacron Dyes

Werdenberg, H, *Ciba Rev* #133, 34-5, August, 1959

Wool is usually printed in the chlorinated state. Chlorination enhances the affinity of the wool fiber for dyes and at the same time reduces its felting ability, thus rendering the material more suitable for printing. The degree of chlorination largely determines the color yield, the brilliance of shade, and the levelness of the prints. The heavier the chlorination, the greater is the dye uptake.

Acid wool dyes give bright shades, but the fastness properties obtained are not entirely satisfactory, as a rule. The 1:1 metal complex dyes and, still more so, the 1:2 metal complex dyes exhibit very good fastness properties, but the shades are rather dull. This also applies to the chrome dyes.

Cibacron dyes are proving their worth in direct printing on wool, giving very bright shades of high tinctorial strength, perfect penetration, excellent levelness and good fastness properties. The best results are obtained with the addition of 200 g/kg urea, and with sodium alginate as thickener, with an addition of Albatex BD to prevent reduction of the dyes during steaming.

After printing and drying, the goods are steamed for 10-15 minutes, rinsed cold and then at 140-175°F, treated with ammonia at 140°F, and neutralized with formic acid.

Silk has affinity for all classes of wool dyes and some direct dyes, and can also be printed with certain vat dyes under suitable conditions. What customers mostly look for in printed silks, however, are brilliant shades and tasteful designs. These conditions are best met, according to the author, by Cibacron dyes, which possess outstanding brightness of shade, absolute rubbing fastness, and very good allround fastness properties.

The tinctorial yield of Cibacrons on silk is somewhat lower than on cellulosic fibers. Unlike wool, silk requires an addition of alkali for satisfactory fixation of Cibacron dyes. The printing paste contains urea, sodium bicarbonate, Albatex BD and sodium alginate. The printed goods are steamed, rinsed, etc, in the same manner as for wool.

•

Choosing Between Steel and Wooden (Dye) Vessels

Peel, R A, *Dyer* 122, 255-7, Sept 11, 1959

The stainless steel dye-box is extensively used for the dyeing of manmade fiber fabrics, but there are many wood vessels still in use for such fabrics as "spuns". In many a dyehouse, at times of expansion, the choice has to be made between stainless steel and wood for new dye vessels. The former has the advantage of smooth, antisnag surfaces, easy cleaning, quick change of shade and pure, uncontaminated dyeings. It also has the disadvantages of high capital cost, susceptibility to chemical attack, eg, by sodium chlorite (although this can be minimized by care in formulation), tendency to collect scum from greasy baths, and slippage of the fabric on the metal surface of the reel. This last nuisance may nullify the advantages of quick change from one color to another, because if the reel is wrapped with cotton cloth to prevent slippage, the wrapper must be changed before a different color is to be dyed.

The wood dye-box has the great advantage of low capital cost; it is easily repaired, can be made in the works to the firm's own special design, and is particularly suited for the big dye-box such as a double-reel 2500-gallon type. Its chief disadvantages are color and chemical contamination (one box must be kept to a similar color or bleached out for a change of shade) and bruise and abrasion marks.

Both types of dye-box can give fricton marks. The slippage on a metal reel causes the rope to be hit by the reel too often, and chafing results. The wood box with its knots, screws, bolts and roughened surfaces can cause rub marks which cannot be removed.

In planning new dyeing equipment, if the vessel is to be used for dyeing at high temperatures, it should be covered, to save steam and promote quicker dyeing and better penetration.

The author gives useful suggestions for the design and construction of dye-becks, and discusses the different types of reel, methods of adding the dye solution, location of steam pipes, etc.

•

Recent Developments in the Continuous Dyeing of Wool and Mixtures of Wool with Synthetic Fibers

Ris, H, Hirsbrunner, H R *et al* (Presented at Congress of International Federation of Associations of Textile Chemists & Colorists, Sept 17, 1959; published by Soc of Dyers & Colourists)

As a result of recent research, novel continuous or semicontinuous

(continued on page 64)

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You name it—resin finishing, water repellency, dyeing, almost any process. Your results can be only as good as your preparation. And just as there's no substitute for good, thorough, complete and even preparation of fibers and fabrics, there's no substitute for TRITON surfactants and detergents.

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News of the Trade

Hercules Powder Acquisition of Imperial Color Tentatively Approved

Hercules Powder Company and Imperial Color Chemical and Paper Corp announced on January 12 that both companies have agreed in principle to the acquisition of the business and assets of Imperial in exchange for Hercules stock.

Albert E Forster, president of Hercules, and Arthur F Brown, president of Imperial, in a joint statement, said the proposed action has been tentatively approved by the directors of each of the companies.

If the boards of directors of both companies approve a formal agreement now in preparation, and the stockholders of each company authorize the steps necessary for completion of the transaction in March meetings, the 1,019,604 shares issued and outstanding of Imperial common stock will be exchanged for 509,802 shares of a new class of Hercules stock, to be designated $2 Cumulative Convertible Preferred Stock. The new stock will be subordinate to the existing Hercules 5% preferred stock, and will be noncallable for 5 years. The exchange would be at the rate of two shares of Imperial for each share of the new Hercules Preferred Stock. Such new Hercules stock would carry the right to be converted into 9/10 of a share of Hercules par value Common Stock for a period of 60 days subsequent to its date of issue and thereafter into 8/10 of a share of such common stock.

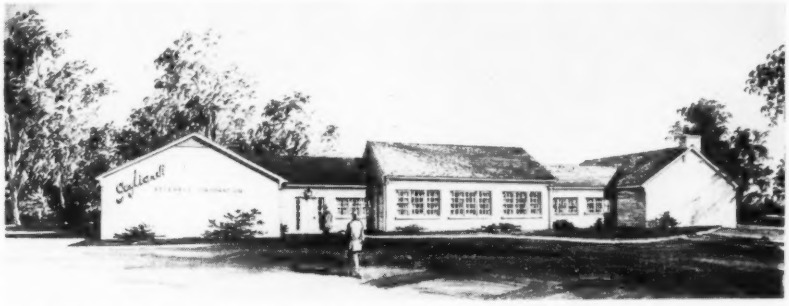
Imperial Color Chemical & Paper Corp originated in 1902, and over the years it has become one of the leading U S suppliers of pigment colors. The company, with its principal office in Glens Falls, NY, has plants located in Glens Falls and Plattsburg, NY, and a wholly owned subsidiary in St Johns, Que, Canada.

Hercules Powder Company commenced business in 1913. It is a major supplier of chemical materials, its principal business being manufacture and processing of chemical raw materials and intermediates serving a wide variety of industries. Hercules manufactures its products in twenty-three plants in the United States and also has interests in subsidiaries in several foreign countries.

President Forster of Hercules and President Brown of Imperial stated that the combination of the two companies will broaden their present diversification, and should benefit the stockholders and employes of each company.

For the calendar year 1959, Imperial expects to have total sales of about $27,127,000, net income of about $1,910,000, equivalent to $1.88 per share of common stock.

In the same period, Hercules sales are expected to aggregate approximately $280,000,000, with a net income of about $23,500,000 or $2.75 per share of common stock.



Artist's conception of new laboratory of Gagliardi Research Corp at East Greenwich, RI

GRC Building New Lab

Gagliardi Research Corp has announced that construction on a new laboratory building and enlarging and modernizing of the laboratory facilities at the present location, 5454 Post Road, East Greenwich, RI, has begun.

The new laboratory building reportedly will provide approximately a 200% increase in floor area and will allow for installation of specialized laboratory equipment on a more functional basis as well as increasing the size of the Organic Laboratory. In addition, the physical improvements and additions reportedly will provide adequate space for an increase in research personnel, not only to augment the present staff, but also to provide for specialized research and development experience in the textile and related fields. The increase in personnel is necessitated by the present and proposed client-sponsored chemical research and development projects.

Completion of the entire construction work is scheduled for June 1960.

●

HNCC Expanding at Fords

Heyden Newport Chemical Corp is starting a plant expansion at Fords, NJ that will double the current production of derivatives of ortho and para chlorotoluenes—building-block chemicals for dyestuffs.

A unique process developed in the company's laboratories reportedly will be used for the first time in the new plant facilities to produce such derivatives as para chlor benzyl chloride, ortho chlor benzaldehyde and ortho and para chlor benzoic acids.

Total expansion is to be completed in late 1960. Production will be marketed by the Heyden Chemical Division.

●

Production of Acrylic Emulsions Started at Borden's Demopolis Plant

Initial production of acrylic emulsions in a new manufacturing plant at Demopolis, Ala, has been announced by The Borden Chemical Co. The new unit, Borden's first in the South, will add "substantially" to the company's existing production capacity for these products.

Borden Chemical also operates similar manufacturing facilities at Leominster, Mass, Illiopolis, Ill, and Compton, Calif. The company is the only major four-plant producer in this field.

Charles W Smith, general manager of Borden Chemical's Polyco-Monomer department, stated that the company has developed a significantly new manufacturing process for acrylic emulsions which offers both quality and unit-cost advantages. "We are relying on this engineering plus and the strategic location of our plants to place us in a strong competitive position in these growing markets," he said.

A match is applied in a vain effort to burn a piece of flame-resistant cotton during a recent meeting of industry and U S Department of Agriculture scientists at the Department's Southern Utilization Research and Development Division at New Orleans, La. The industry scientists are collaborators appointed by the USDA to help the Division maintain a practical and productive cotton utilization research program. They meet annually with Division scientists. From left to right are C H Fisher, director, Southern Division; Lindsay Dexter, assistant treasurer, Pepperell Manufacturing Co, Boston, Mass; C L Hoffpauir, assistant director, Southern Division; E L Patton, chief, Engineering and Development Laboratory, Southern Division; and George S Buck Jr, assistant to the executive vice president, National Cotton Council, Memphis, Tenn.

Discussing "wash-wear" research at the USDA's Southern Utilization Research and Development Division at New Orleans, La are Agricultural Research Service scientists and officials of the National Cotton Council. They were in New Orleans recently for a meeting of Southern Division scientists and industry representatives appointed by the USDA to review current research and make recommendations on new research approaches in a continuing effort to better cotton's position in the highly competitive textile market. Shown above, left to right, are C H Fisher; A Mason DuPre' Jr, assistant to the administrator Agricultural Research Service, USDA, Washington, DC; George S Buck Jr; Robert Miraldi, National Cotton Council, Washington, DC; and J D Reid, head of the Wash-Wear Task Force of the Southern Division.

Garment Dyers Look to Boost in '60 Trade

Reports of the best industry year in the past ten in 1959 and prospects for record 1960 volume with anticipated mastery over several man-made fibres, stemmed from last month's Annual Conference of the Garment Dyers Guild of America. The meeting, held at the Acme Dye House and Hotel Carter in Cleveland, produced the largest attendance of any previous Guild Conference.

Representatives of the nation's major redyeing plants launched a new industry-wide project aimed at developing methods for the effective and inexpensive redyeing of better grades of the new types of man-made-fur coats popular today.

Gabriel Illovsky, president, Master and Tru-Color Dye Works, Queens, NY, was elected Guild president for the coming year and San Diego was chosen as the site for the 1960 conference.

Ernest Gecz of the Paul Dyeing Co, Newark, NJ, was named vice president. Outgoing president Leon Teichner of the Almore Dye House, Chicago, was presented a special Guild citation for his long services to the dye trade.

"The effects of Guild programs in perfecting redyeing methods for the most commonly used clothing synthetics is reflected in the increased volume of member dye houses across the nation," Mr Illovsky stated. He pointed out that mastery of the newer blends, such as Dynel-wool, will open up vast new markets for the redyeing trade.

Another factor in the increased dye industry trade was reported to be the expanding trade with hotels and motels throughout the country for the refurbishing and recoloring of linens and furnishings.

The Garment Dyers Guild is comprised of the wholesale dye houses which service retail drycleaning stores and large institutions.

In an address before the Guild's annual banquet, Elliott Morrill, Corn Products Corp, who was completing his third year as a vice president of the American Association of Textile Chemists and Colorists, termed the efforts of "do-it-yourself" dye producers and professional dyers as "serving a common cause."

He said that wholesale dyers and home dye manufacturers were aiding, rather than hurting each other, in competitive efforts to promote their own types of recoloring for garments and furnishings.

"Anything that brings Mrs Homemaker a greater awareness of the uses of redyeing, benefits both trades," Mr Morrill said. He also pointed out many instances in which persons were introduced to dyeing through packaged dyes and became professional dye customers for larger items and those which required perfect results.

The redyeing field is still wide open, with prospects for huge future expansion, according to the speaker. He said that 50 million packages of RIT, his company's packaged home dyes, were sold annually although half of the persons interviewed in his company's nationwide survey had yet to utilize redyeing in any form.

In another major address at the Annual Conference, newly elected president Gabriel Illovsky outlined new methods of vat-dyeing table linen, to meet the demand of restaurants and hotels for inexpensive color coordination. He said additional treatment was needed for successful redyeing of the uniformly crease-resistant finishes of European linens being imported in greater volume than ever before since the war.

Another favorable trade development during the past year, reported at the meeting, involved newly adopted policies of schools throughout the country to maintain drapes through periodic dyeing. A policy of cleaning school drapes for three years and cleaning and dyeing on the fourth, is being adopted, the Guild reported, by Boards of Education, in major cities, and should produce an added boost to the industry in 1960. It is estimated that this policy will add one third longer life to stage and window drapes in the various schools.

Guild directors attending the meeting included: Walter Loebl of the Loebl Dye Works, Roanoke, Va, a past president; Guild treasurer John Egli of the General Dyeing Co, Indianapolis; Leon Teichner of the Almore Dye House, Chicago; Lawrence Jacobson of the Jacobson Dye Works, Philadelphia; John Eurich of the Dye House, San Diego, who will be host to the 1960 meeting; Alex Weiss and Andrew Klein of the Acme Dye House, Cleveland, hosts to the 1959 conference; and Frank Stuewe of the Seneca Dyers, Rochester.

Special Conference delegates included Max Berliner of Roanoke; James Evans of Indianapolis, Paul and William Stuewe of Rochester; Arthur Teichner of Chicago, and Burton Halpern, Guild information director of New York.

• NAMES IN THE NEWS •

OTTO HAAS, founder and honorary chairman of the board of Rohm & Haas Co, died Jan 2 at his home in Villanova, Pa. His death occurred only two days after a special meeting of the board of directors of the Company had been held. As a result of the meeting, Mr Haas had been elected honorary chairman of the board, following its acceptance of his retirement as chairman of the board, president, and chairman of the Executive Committee.

Ralph Connor was elected chairman of the board, and will continue as a member of the Executive Committee as a vice president in charge of research of the company, a position which he has held since 1948.

Fritz O Haas was elected president of the company and chairman of the Executive Committee of the board. He had been executive vice president since 1953, a member of the Executive Committee since 1951, and a director of the Company since 1948.

John C Haas was elected vice chairman of the board, replacing Fritz O Haas in that capacity. John C Haas is also vice president of the company and a member of the Executive Committee.

Otto Haas was born in Stuttgart, Germany, on March 15, 1872. Having lost his father when he was still a boy, he did not have means to finish high school and started to earn his living as an apprentice, at a bank.

He came to the United States in 1902 and was associated for several years with an export firm dealing in hides.

In 1905 his friend and subsequent business associate, Otto Rohm, wrote him from Germany that he had made an important discovery in the field of processing leather, Oropon, and suggested that they form a partnership for the development of his invention. Mr Haas accepted the proposal but told his friend that, as he had made up his mind to live in the United States, he was willing to return to Europe only so long as it was necessary to establish the new enterprise there. Accordingly he went back to Germany in 1905 and the Rohm & Haas partnership was established in 1907. As the new firm proved to be a success he returned to the United States in 1909, at which time the American firm was founded. Dr Rohm remained in Germany as head of the German company.

Oropon is used to prepare hides for the tanning process. In time it became well established among leather manufacturers and in 1916 a plant was built at Bristol, Pa. The company's activities expanded substantially in the following years—not only in the development of additional chemicals for leather manufacture but also of other products useful in a wide range of industries. These include synthetic resins of many types, plastics, agricultural and textile chemicals. Today the company operates plants at Bridesburg, Philadelphia, Bristol, Pa, Houston, Texas and Knoxville, Tennessee. It also has subsidiaries abroad which manufacture some of its products.

Mr Haas was primarily interested in the welfare of its employees in many of whom he took personal interest in times of sickness and distress.

He is survived by his widow, Phoebe W; his two sons, Fritz O and John C; and seven grandchildren.

•

Stier

Batley

The election of *George G Stier* as president of Nopco Chemical Co has been announced by the board of directors. Mr Stier was previously vice president in charge of Nopco's Plastics Division at North Arlington, NJ. *Ralph Wechsler*, former president, was elected chairman of the board, succeeding *Thomas A Printon*, who will continue as a director and member of the executive committee.

In another executive change, the board announced the election of *Harry A Batley* as executive vice president. Mr Batley most recently served as vice-president in charge of Industrial Production. *G Daniel Davis*, former executive vice president, becomes vice chairman of the board and continues as president of Jacques Wolf & Co, a Nopco subsidiary.

•

Putnam Chemical Corp has announced the following organizational changes and additions to its southern sales and technical personnel.

J L Wyman has been named Southern sales manager, with headquarters at Charlotte, NC. Mr Wyman has previously been sales representative in South Carolina and Georgia.

Therrien

Wyman

Young

L E Therrien has been named technical sales representative for South Carolina, with headquarters at Greenville. Previously, Mr Therrien was sales representative in New England.

J B Young has been named Southern technical service representative, with headquarters in Charlotte. Previously, Mr Young was manager of Technical Service Laboratories at Beacon, NY.

•

Edward L Donovan, who was president and general manager of Textile Chemicals Corp, Somerset, Mass, joined United Aniline Co on Jan 1 as manager of the Chemical Dept. United Aniline will continue the operation of the factory in Somerset.

•

L J Sheps, Trilon Chemicals Ltd, president of the Textile Technical Federation of Canada, has been elected a Fellow of the Society of Dyers and Colourists.

•

In a move to place more emphasis on its marketing activities, Pennsalt Chemicals Corporation has created the new office of vice president of marketing. *Albert H Clem*, experienced executive in Pennsalt sales and service, has been named to the post.

Replacing Mr Clem as general manager of the Chemical Specialties Division is *George R Lawson*, formerly director of marketing for Pennsalt's Industrial Chemicals Division.

Stevenson

Hollis

Whitt

Cook

Miller

Dyer

Penaud

Osolin

Ciba Co Inc has announced a number of organization moves to further expand and intensify sales and technical services in the Southern District.

C O Stevenson, Southern sales representative for the District since 1945, has been appointed sales manager of the District.

George Anderson has been assigned as sales representative in the Georgia territory, and *John Clark* replaces Mr Stevenson as sales representative for the South Carolina territory, making his headquarters in Greenville.

Neely M Hollis and *J C Whitt* are new appointees to the sales and technical service staffs, operating from the Ciba Charlotte District sales headquarters.

Upon their return from a training program in Switzerland, the following members of Ciba's Chemical Specialties Division have been assigned to specific duties: *Peter A Cook,* to sales and technical service responsibilities, operating from the Charlotte branch office; *Clyde L Miller Jr,* transferred from the dye group to the Chemical Specialties Division; *Clinton A Dyer,* assigned to the staff of the Chemical Specialties Division operations for the Charlotte, NC area.

Ciba has announced the appointment of *P L Penaud* as manager of its newly established Pigments Division, with headquarters at Fair Lawn, NJ. *H G Osolin* is in charge of technical operations within the new Division, which will handle a broad range of organic pigments, pigment dispersions and soluble dyes. The range of products available reportedly will include a number of specialties developed by Ciba.

Mr Penaud was formerly associated with Ciba's pigment activities in both technical and sales capacities in western Europe. Mr Osolin hitherto has been in charge of the pigments application, technical service and control laboratories of the parent company, Ciba Ltd, in Basel, Switzerland.

•

Maurice S Letourneau, New York district sales manager for the Borden Chemical Company's Polyco-Monomer Department since last August, has been promoted to Eastern District sales manager.

In his new position, Mr Letourneau will be responsible for directing the sale of Borden's full line of polymers in the New England, New York, Philadelphia, and Southern market areas.

•

The retirement of *Joseph C Blauvelt,* vice president and director of Stein Hall & Co, Inc, took place on December 31. A dinner in his honor, held at the Waldorf-Astoria on the evening of December 9, was attended by Stein Hall officials and coworkers.

Mr Blauvelt completed his fortieth year with Stein Hall in July 1959. He will remain as a consultant with the firm.

•

William Spier Jr has been named salesman in Virginia and the Carolinas for Atlas Powder Company's Wilmington Region chemicals sales office.

Mr Spier's headquarters will be in Charlotte, NC, marking a move of the office from Richmond, Va.

Mr Spier joined Atlas in January, 1959.

Corn Industries Research Foundation, Inc, has announced the election of *Frank K Greenwall* as president. Mr Greenwall is chairman of the board of the National Starch and Chemical Corp, New York. He succeeds *William T Brady,* president of Corn Products Co, New York, who continues as chairman of the Foundation. Mr Brady and *A E Staley Jr,* chairman of the board of A E Staley Mfg Co, Decatur, Ill, were elected vice presidents of the foundation.

•

Richard E Gromacki and *John Arble* have been transferred to the new products sales department, M A Division, Wyandotte Chemicals Corp, from the company's Research Division. Mr Gromacki was named assistant manager—urethanes.

Mr Arble has become technical representative for the new products department.

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Promotion of three Sales Department members was recently announced by Union Carbide Chemicals Co, division of Union Carbide Corp. They are: *Eugene H DuVal* and *John E Nimz* to assistants to product sales manager; and *Fred L Martin* to technical representative, San Francisco district.

In his new assignment, Mr DuVal will work on the marketing of functional fluids and Ucron lubricants.

Mr Nimz will assist in the marketing plans for acids, anhydrides, chlorinated solvents, methanol, and vinyl acetate.

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Wallerstein 25-Year-Service Banquet—l to r: Frederick C Rupp, with the firm 44 years; John M Kimm, with the firm 41 years; Arthur C Emelin, Wallerstein president

On November 11, Wallerstein Company, Staten Island, NY, held its annual "Twenty-five Year Service Banquet" in the Plantation Room of the Staaten Restaurant. It was attended by old and new members of the Twenty-five Year Service Club.

Nine new members were welcomed: *Dennison B Cowles, Thomas F Dogery, Frank A Driscoll, George F Driscoll, Philip P Gray, George A Havorka, Kenneth K Schoenfeld,*

Charles J Smyth and *Irwin Stone*. They were presented with watches by the company's president, *Arthur C Emelin*, who spoke briefly and congratulated each of the men.

An "As You Were" program was an additional highlight of the evening. This featured baby pictures of the new quarter-century members and provided a touch of light comedy for the evening.

The Club has a current membership of 78 men and women with a total of 2421 years of serivce. The average for the group is 31 plus years. Fifty-five members are still on the job. Twenty-three have retired.

The Wallerstein Company is a division of Baxter Laboratories, Inc.

•

P L DuBrow, S H Shapiro and *R E Baarson* have been appointed assistant research directors of the Armour Industrial Chemical Company.

Mr DuBrow assumes responsibility for applied research and technical service. Mr Shapiro is in charge of the organic and process sections and Mr Baarson is responsible for the new products applications and flotation sections.

Charles L Ray has been appointed flotation section head succeeding Mr Baarson and *Jack N Dybalski* has been named general applications section head in place of Mr DuBrow. *Don Berenschot* is section head of new products applications.

Peter E Macy has been appointed derivatives sales representative for the Company with headquarters in St Louis. Mr Macy's territory will consist of all of Missouri, most of Iowa, southwest part of Illinois and northern portion of Arkansas.

•

The appointment of five vice presidents for the new and re-organized Corn Products Sales Division of Corn Products Company was announced recently.

They include *Robert W Bond*, vice president, market planning; *Darrel K Brickley*, vice president, sales services; *Jenkin J Jones*, vice president, refined and processed oils; *John M Krno*, vice president, sales promotion and development; and *Henry M Mays*, vice president, feed and by-product sales.

The Corn Products Sales Division will be responsible for the sales and merchandising of all industrial products, including those previously handled by the company's Best Foods Division.

Corn Products Company's line of consumer products will become the responsibility of the new Best Foods Division.

Brouillard

Katz

McCord

Shaw

Smock

Wich

May

Underwood

The Dyestuff and Chemical Division, General Aniline & Film Corp, has named *Robert E Brouillard* sales manager for its newly established Pigment Department. Heretofore, the company has handled both pigments and dyes as a unit in sales and production.

Other appointments within the new department are as follows:

Leon Katz, formerly section manager in charge of pigments and dyestuff research and development, has been named product manager—pigments.

Maurice L McCord, who has held a number of posts, including sales representative and office manager, at the General Dyestuff Company's offices in San Francisco, has been named Western regional manager.

John D Shaw has been named Eastern regional manager, with headquarters in New York. His most recent assignment was that of pigment sales specialist responsible for sales to dry color houses.

Theodore B Smock, who has been in charge of GDC's Los Angeles office since 1939, has been named Mid-Western regional manager, with headquarters in Chicago.

Emil A Wich, formerly product engineer in the Pigment Technical Department, is now manager, technical services.

* * *

Antara Chemicals, a sales division of General Aniline & Film Corp, has announced the appointment of *Allison K May* to manager, surfactants & related chemicals, and *Eldin S Underwood* to manager, heavy chemicals. Mr Underwood, who succeeds Mr May as manager, heavy chemicals, was formerly Eastern regional manager.

Alfred W Purdy, until now a sales engineer in the Philadelphia office, succeeds Mr Underwood as Eastern regional manager, with headquarters in the New York office; *John P Miller*, a sales engineer at St Louis since 1958, succeeds Mr Purdy in Philadelphia; and *Joseph A Czerwinski*, formerly a sales correspondent in Chicago, succeeds Mr Miller in St Louis.

William C Brunson, a sales engineer, has been transferred from Atlanta, Ga, to the New Jersey territory and *Eugene M Kennedy* succeeds Mr Brunson in Atlanta.

•

Meer Corp has announced the appointment of *William A Meer* as director of its quality control laboratories at North Bergen, NJ and *Thomas Gerard* as director of its new plant hydrocolloids laboratory.

Mr Gerard's responsibilities will be to expand Meer's service to its customers in uses and applications of water-soluble gums, and he will also direct the company's efforts in new product research and development. He was previously associated with Stein Hall & Co, Inc.

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The following are winners of the annual Ciba Co Inc scholarships for 1959-60: *Mark E Atkinson* and *Thomas Garrett*, Clemson College; Clemson, SC; *Neal R Langley*, Univ of Washington, Seattle, Wash; *Sidney Barkoff* and *Lawrence C Canavan*, Philadelphia Textile Inst, Philadelphia, Pa; *Ted E Hager* and *Elbert S* Mullis, North Carolina State College, Raleigh, NC; *Hollis E Crowe*, Univ of Maine, Orono, Me; *John Santos*, Lowell Technological Inst, Lowell, Mass.

Abstracts

(*continued from page 57*)

dyeing methods for wool and its mixtures with synthetic fibers have been developed which are said to offer entirely new possibilities in practical dyeing. The methods can be applied to wool slubbing, woolen fabrics, ski gaberdine cloths made of wool and crimped nylon crepe, and similar fabrics.

The process involves the following operations: padding, intermediate drying by dry heat, "acid-shock" fixing (development in a hot acid bath), and finally washing to remove a thickener used. The "acid-shock" fixing may be replaced partly or completely by steaming under pressure, or by a wet heat treatment (eg, by the Pad-roll method).

By using this method, the authors state, the dyer can overcome the difficulties in dyeing wool which arise from the wide variations which occur in the capacity of individual fibers to absorb dyes and which lead to skitteriness, and those difficulties which arise from warp stripiness. Furthermore, the method makes it possible to dye wool and its mixtures continuously in pale, medium, and even heavy depths with excellent fastness.

Details of the new "acid-shock" method are given. The pad liquor, in addition to the dye, contains ethyl cellosolve, ammonia, aluminum acetate, a "special wetting agent", and sodium alginate as a thickener. For dyes, the 2:1 metal-complex dyes are recommended, as well as selected weakly acid-dyeing wool dyes.

After padding and drying, the goods are given a short passage through a formic acid bath at 60°C. They are finally rinsed to remove the thickening.

In using the pad-steam method (recommended for slubbing), aluminum acetate is not used, and acetic acid replaces ammonia in the pad-liquor. After padding, the goods are steamed for 90 seconds at 101-2°C and are given a brief fixation treatment in a formic acid bath.

Advantages claimed for the slubbing dyeing process include very level dyeings, excellent fastness, and good coverage of tippy wool.

Tables are included, listing the behavior of a large number of dyes when used either by the pad-dry-"acid-shock" treatment or by the pad-steam method.

A process for the continuous dyeing of wool/polyamide crimped-fiber fabric is also included.

Eleven references to the literature are cited.

The Elimination of Barriness in the Dyeing of Continuous-filament Nylon Fabrics with Acid and Metal-complex Dyes

Robin, J B (Presented at Congress of International Federation of Associations of Textile Chemists & Colorists, Sept 18, 1959; published by Society of Dyers & Colourists)

Although disperse dyes are satisfactory for pale colors on nylon, they lack wet fastness in medium to dark shades.

Acid dyes give bright colors fast to water, but unfortunately their use has been limited by such defects as poor migration properties and low fiber-saturation value, which makes it difficult to produce dark colors, and causes blocking effects when the components of a mixture of dyes have different diffusion coefficients. The migration defects of acid dyes have been partly corrected by the use of leveling agents; blocking effects are avoided by selecting dyes having similar dyeing rates; and the development of the 2:1 metal-complex dyes, having high saturation values, enables dark colors, even deep blacks, to be obtained.

However, there remained one serious defect: the irregular dyeing affinity for nylon shown by these dyes. The differences take the form of warpwise stripes and weftwise bars.

The author gives a short outline of different theories that have been advanced for the dyeing mechanism with anionic dyes on nylon, and the known physical and chemical causes of the affinity irregularities just mentioned. To cover the barriness produced by these dyes it had previously been suggested that selected acid dyes should be applied slowly in the presence of 1) swelling agents to increase the permeability of the fiber, 2) certain anionic agents which tend to "level" the high-affinity sites on the fibers, or 3) cationic agents which form complexes with the dyes. All of these processes have their disadvantages, the author states.

A process that has now been developed for elimination of barriness and patented by the Société Rhodiacéta is applicable to all anionic dyes (acid, 1:1 and 2:1 metal-complex, and direct dyes); it consists in dyeing the nylon in strongly acid baths (pH 3-4), preferably above 100°C, in the presence of a carefully chosen mixture of sulfonated products to block the sites of high affinity, cationic products to control the uptake of dye, and reducing agents to eliminate any possible oxidation of the fiber. This process is described in full detail.

Such a mixture of assistants does not reduce the color yield and is said to permit fabrics made of continuous-filament nylon to be dyed without barriness, and previously singed fabrics of nylon staple yarn to be dyed without producing skitteriness.

Thirty references to the literature are cited.

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The Mechanism of the Action of "Carriers" in the Dyeing of Polyester Fibers with Disperse Dyes

Rochas, P and Courmont, M (Presented at Congress of International Federation of Associations of Textile Chemists and Colorists, Sept 18, 1959; published by Soc of Dyers & Colourists)

The mode of action of "carriers" has been investigated, mainly by accurate determination of quantities of dye (estimated photocolorimetrically), water (by the Karl Fischer method), and of carrier (calculated by difference) retained by the polyester fiber.

The "carriers" have been classified in six groups according to their aqueous solubility and to whether their melting points are above or below the temperature of the dyebath. To each of these groups corresponds a characteristic absorption curve (amount of carrier held by the fiber as a function of its concentration in the bath). With each carrier a part is absorbed inside the fiber and a part forms a surface deposit.

The experiments described in this paper show that all so-called "carriers" increase the rate of dyeing of polyester fibers by their action upon the fiber structure. The agent which is first absorbed becomes strongly associated with the polymer molecules in the amorphous regions, modifying the physicochemical structure of the fiber in such a way as to facilitate the entry of dye molecules. Any further quantity of agent which is absorbed is only very loosely associated with the fiber, and is readily removed by solvent or hot-water washing. This part of the agent, if it is a good solvent for disperse dyes, can have a detrimental effect . reducing the absorption of dye.

The effect of these agents is related to their physical properties, and all agents produce a similar increase in dye absorption when present in similar amounts in the fiber. The effects seem to be determined more by the physical properties of the agents and the fiber than by their chemical structure, but the effects do vary with individual dyes, depending upon the

solubility and the chemical structure of the latter. The effect of these agents upon the dye in the dyebath is less significant.

Thirty-three references to the literature are cited.

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Absorption of Chlorine by Resin-treated Textiles

Schefer, W (Presented at Congress of International Federation of Associations of Textile Chemists & Colorists, Sept 16, 1959; published by Soc of Dyers & Colourists)

With the increasing use of synthetic resins in textile finishing, cases of damage through retention of chlorine by urea-formaldehyde, melamine-formaldehyde, and similar nitrogen-containing finishes are becoming more frequent. Such retention of chlorine can occur when hypochlorite solutions are used for washing purposes. Subsequent ironing may then cause loss of tensile strength and yellowing.

This problem has been studied by the Swiss Federal Laboratory for Testing Materials, on the one hand to establish testing methods for the determination of the potential damage to which resin-finished textiles are exposed by retained chlorine, and on the other hand to find ways to prevent such damage.

The absorption of chlorine occurs through reaction of the hypochlorite ion with primary or secondary amino groups in the resin, with formation of compounds of the chloramide type. These compounds on heating split off hydrochloric acid and atomic oxygen, and in consequence cause chemical damage. Simultaneously with the uptake of chlorine, decomposition of the resin by oxidation takes place. The two processes influence each other, and both depend to a great extent on the temperature, pH, and concentration of the hypochlorite solution.

With certain types of resin, amounts of more than 0.03% of retained chlorine (on the weight of the fabric) can cause damage on heating, while with other resins such small quantities of chlorine are less harmful.

By applying the test methods of the Swiss Laboratory, which are described, to numerous commercial samples, a great mass of data was collected. These data show the behavior of the various types of resins towards hypochlorite solutions, the effect of the conditions of condensation on chlorine retention and, further, how the tendency to retain chlorine is affected by the washing treatment given to the textile material during use. The principle of the testing method and the experience gained with it are discussed. Methods of avoiding chlorine damage are suggested, both for the finisher and for the consumer.

Twenty-three references to the literature are cited.

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Advancing Frontiers of Nylon and Dacron Polyester Fibers

Nebel, R W, *Textile Research J* 29, 777-86, Oct, 1959

Several examples of what is believed to be typical of the principal direction of evolution of thermoplastic fibers are given—ie, the development of special nylon and polyester fibers that, while retaining their basic fiber qualities, will be tailored for specific end-use applications.

The preparation of these special fibers has been accomplished by making use of the thermoplastic nature of nylon and polyesters. By changing the manufacturing process, a nylon staple fiber has been developed that has a load-elongation curve similar to that of cotton; blends with cotton containing only 25% of this nylon showed an average improvement in fabric life of 70% over that of cotton alone.

Another modification of nylon is designed specifically to give carpets a luxurious hand with soil and crush resistance, intrinsic durability, and freedom from fuzzing or pilling; this specially engineered fiber has a selected denier, roughly triangular cross-section, and a curvilinear crimp.

The use of a sewing thread of Dacron specially prepared so that it will elongate when ironed has greatly alleviated the problem of seam pucker in garments.

Also, a lightweight nylon tricot fabric with excellent covering power and hand can be obtained by Schreiner calendering 20-den nylon tricot fabric and then finishing it by treatment in a beck.

Details of these special fibers are given. The author comments:

"Creases and pleats that stay in, fabrics that resist mussing and wear wrinkling, and hosiery that doesn't sag are some of the benefits to the consumer of the permanent thermal memory of these fibers. Beyond these advantages lies the entire field of wash and wear performance of garments of Dacron and its blends."

In conclusion, the author states:

"We have attempted to show here that nylon and Dacron fibers are basic structural materials with a versatility that we are only starting to appreciate."

Four references to the literature are cited.

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The Heat Transmission of Fabrics in Wind

Niven, C D, *Textile Research J* 29, 826-33, Oct, 1959

The author deplores the fact that "people are prepared to manufacture, sell, buy and wear clothing for subzero weather without any idea of its insulating value in figures. Apparatus and information are needed not only to help direct the manufacturer's program in improving the winter coats he is putting on the market but also to assist the buyer to select a warm coat before he tries it out in cold weather."

Recantly the writer has attempted to find a method of test which will do this. Details are given of the apparatus employed, including a hot plate and a wind tunnel.

The thermal transmission of various combinations of fabrics was measured on the hot plate in winds around 17 mph under conditions simulating to some extent those often present when outdoor clothing is worn in winter. The fabrics tested included nylon, both uncoated and coated with Neoprene, twills, "millium", "wateline", urethane, batting, goosedown, "Furleen", "Cloud #9", "Elysian" and "Frieze" overcoatings, and raccoon and beaver fur. Figures are tabulated, showing the insulating effect of all these fabrics.

The results are discussed in detail. They show, for example, that winter overcoats could be immensely improved by use of semi-Neoprene-coated nylon cloth and goosedown for cold windy weather. A conventional winter overcoat for men is shown to be quite inadequate, while the pile fabrics without wind-proofing are equally disappointing.

The author suggests that a nylon and goosedown coat could be produced which would be warmer than even an insulated beaver coat and yet weigh 3½ lbs less than an uninsulated beaver coat.

It is also pointed out that neither of the imitation fur fabrics tested measured up to real fur. The author suggests that the immediate problem is to determine why this is so, and to see how either goosedown or eiderdown can be used with the imitation furs to enable them to compete with and even excel real fur in efficiency.

Seven references to the literature are cited.

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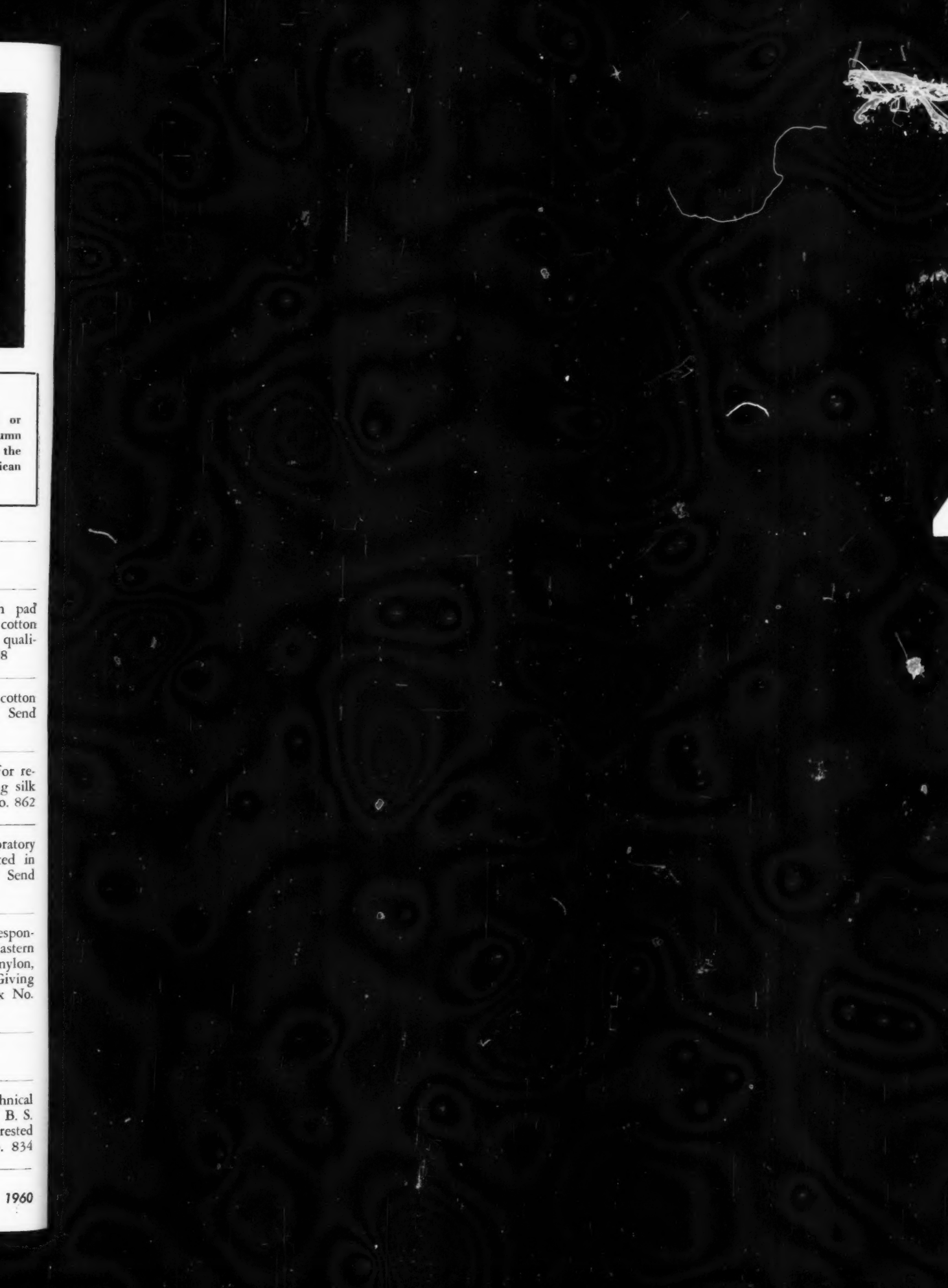
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